Keystone Steel & Wire

Corrective Measures Implementation Workplan

Revision 2.0

April 17, 2006

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1.0 INTRODUCTION

This Corrective Measures Implementation (CMI) Workplan has been prepared by ENTACT Services, LLC (ENTACT) on behalf of the Keystone Steel and Wire Company (Keystone) for its manufacturing facility located in Peoria, Illinois (see Figure 1). This CMI Workplan was developed to describe the operational components of the selected corrective measures for the F-Pond and North Ditch Staging Area, as described in the Statement of Basis dated October 14, 2005, in order to fulfill the requirements of the Administrative Order on Consent between the U.S. Environmental Protection Agency (EPA) and Keystone.

1.1 Purpose and Objectives

The objective of this CMI Workplan is to outline the procedures and methodologies to be used for the completion of the corrective measures at the F-Pond and North Ditch Staging Area at the Keystone facility. This CMI Workplan includes a comprehensive description of the work to be performed and an estimated schedule of completion for each major activity. This Plan consists of six sections as summarized below:

- Section 1.0: Introduction. Section 1.0 provides a description of the facility, regulatory history, summary of objectives, and the corrective measures to be implemented at the Keystone facility.
- Section 2.0: Project Organization and Management. Section 2.0 presents the corrective measures management team responsible for implementing the corrective measures.
- Section 3.0: Corrective Measures. Section 3.0 describes the specifics of each corrective measure.
- Section 4.0: Work Products. Section 4.0 presents the work products that will be developed during the implementation of the corrective measures.
- Section 5.0: Project Schedule. Section 5.0 presents the project schedule for the corrective measures.
- Section 6.0: Institutional Controls. Section 6.0 describes the institutional controls requirements for the F-Pond and North Ditch Staging Area upon the completion of the corrective measures.

1.2 Site Location and Description

The Keystone Facility is an active facility located at 7000 SW Adams Street in Peoria County, Peoria, Illinois. The facility encompasses approximately 1,000+ acres and is located in an industrial area of southwest Peoria adjacent to the west bank of the Illinois River.

Construction and operation of the Steel Works and Wire Mill at the facility began shortly after 1900 and has operated in the same industrial mode since that time. The plant began producing steel and wire products and later (in 1950s) added the Mid Mill complex to add industrial wire production capacity. Steel was produced in open hearth furnaces until 1969 when the transition to electric arc furnaces was

initiated. The last open hearth furnace was decommissioned in the 1980s and Keystone now operates two electric arc furnaces (one melting furnace and one refining furnace). All of the areas where contaminated media exist are located within the confines of Keystone's industrial complex on land that is zoned for industrial use. Operation of the property has been industrial for over 100 years and its use is anticipated to be industrial for the foreseeable future.

1.3 Site History

An Administrative Order on Consent (AOC) was established as part of U.S. EPA's implementation of the Environmental Indicators (EI) program under the Government Performance and Results Act (GPRA), as a follow-up to the original RCRA Facility Assessment (RFA) performed at Keystone in 1987. The 1989 RFA Report identified several areas of potential concern, and five of these areas were targeted for further investigation during a U.S. EPA site visit conducted in November 1999. Those five units were specifically listed in the AOC. In late summer 2001, Keystone procured new samples and analytical data at the five units identified as the Sheen Pond, F-Pond, Tail Tracks Landfill, East Pond, and Oil Skimmer Basin. The results of these investigations are described in the *Sampling Report for Environmental Indicators Assessment Investigation* submitted to U.S. EPA Region 5 on January 29, 2002. As presented in the original January 2003 *Final Corrective Measures Proposal*, corrective action is only being required at the F-Pond.

On January 29, 2002, Keystone submitted its *Environmental Indicators Assessment Report* to U.S. EPA Region 5. This report documented Keystone's draft determination that current human exposures to contaminated soil and migration of contaminated groundwater are under control at the facility. U.S. EPA approved this determination, but also requested that Keystone perform additional sampling to confirm whether corrective measures could be necessary in some of the other areas listed in the 1989 RFA, but not included in the 2000 AOC. To address these concerns, Keystone collected additional samples at the North Ditch Staging Area, Slag Processing Area, East Waste Pond, and East Sludge Pond in fall 2002. In the fall of 2003, follow-up samples were collected in the East Waste Pond, and new samples were also collected from the North and South Sludge Lagoons.

Following its review of the new data, U.S. EPA requested that Keystone prepare a revised final corrective measures proposal to summarize the actions to be taken to protect human health and the environment from all current and future unacceptable risks that potentially could result from contaminated soil, sediment and groundwater at the facility. The Revised Final Corrective Measures Proposal for the F-Pond and North Ditch Staging Area was submitted to U.S. EPA Region 5 on February 14, 2005. Revision 1.0 to the Revised Final Corrective Measures Proposal which addressed U.S. EPA's comments and concerns was then submitted on April 12, 2005.

On October 14, 2005, U.S. EPA issued the Statement of Basis for the project which describes U.S. EPA's selected corrective measures for the F-Pond and North Ditch Staging Area. This CMI Workplan was developed to describe the procedures to be implemented to conduct these activities.

For reference, the areas and units discussed in this Workplan are depicted on a layout map of the Keystone facility (see Figure 2).

1.4 Summary of Selected Corrective Measures

The selected corrective measures for the F-Pond and North Ditch Staging Area address lead and iron contamination, as appropriate, in the sediment/soil. The major components of the selected corrective measures, as presented in the Statement of Basis, include the following:

F-Pond

- Dewatering of the F-Pond;
- Identification of characteristically hazardous soils/sediments;
- In-situ treatment of characteristically hazardous soils/sediments, if present, to render the soils/sediments non-hazardous, when generated;
- Excavation of the treated and impacted soils/sediments to achieve the remediation goals;
- Off-site disposal of the excavated soils/sediments as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the F-Pond to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

North Ditch Staging Area

- Identification of characteristically hazardous soils;
- In-situ treatment of characteristically hazardous soils, if present, to render the soils non-hazardous, when generated;
- Excavation of the treated and impacted soils to achieve the remediation goals;
- Off-site disposal of the excavated soils as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the North Ditch Staging Area to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

The selected corrective measures were designed to reduce or eliminate the potential for direct contact, ingestion or inhalation of impacted soils and sediments with lead and/or iron concentrations which exceed the remediation goals in the F-Pond and North Ditch Staging Area. In order to meet this objective, remediation goals for lead and iron were established. These goals are as follows:

F-Pond

- Lead: 800 mg/kg, and
- Iron: 100,000 mg/kg.

North Ditch Staging Area

- Lead: 800 mg/kg.

2.0 PROJECT ORGANIZATION AND MANAGEMENT

The corrective measures management team will consist of the following components and personnel, as described below and shown in Figure 3. ENTACT's assigned management team identified below may change during the implementation of the CMI activities. If there is a change in personnel, the modification will be communicated to the U.S. EPA Project Manager and the team will be altered accordingly.

2.1 Project Management

2.1.1 U.S. EPA Project Manager

Mr. Jonathan Adenuga is the U.S. EPA's Project Manager (PM) for the Keystone facility. Mr. Adenuga has oversight responsibility for all phases of the corrective measures including oversight responsibilities for daily activities implemented during the corrective measures.

2.1.2 Keystone Project Manager

The Project Manager for Keystone is Mr. Chad Erdmann. Mr. Russ Perry and Kevin Lombardozzi, on behalf of Keystone, will be assisting Mr. Erdmann as necessary. The Keystone Project Manager will report directly to the U.S. EPA Project Manager and will be responsible for providing status reports of the progress of corrective measure activities, updating the project implementation schedule and resolving regulatory issues with the U.S. EPA.

2.1.3 Corrective Measures Contractor

ENTACT will be the Corrective Measures Contractor responsible for the construction and implementation of the corrective measures set forth in the Statement of Basis. In addition, ENTACT is responsible for meeting the remediation objectives in accordance with the Administrative Order on Consent issued by U.S. EPA. The following ENTACT personnel will be assigned to perform the key duties described below.

2.1.2.1 Project Coordinator

ENTACT's Project Coordinator is Mr. Greg Dambold. The Project Coordinator will be responsible for the coordination of field activities. Duties of the Project Coordinator will include resolving issues concerning compliance with the AOC, updating the project implementation schedule, resolving regulatory issues with U.S. EPA, and completing status reporting to U.S. EPA and Keystone.

2.1.2.2 Corporate Health and Safety Director

The ENTACT Corporate Health and Safety Director is Mr. Don Self. The Corporate Health and Safety Director will be responsible for writing and reviewing the *Site-specific Health and Safety Plan* and overseeing ENTACT's health and safety program. He will provide direction to the ENTACT Field Project Manager and/or On-site Health and Safety Officer, as necessary, on issues related to health and

safety. The Corporate Health and Safety Director will be responsible for conducting the health and safety orientation meeting prior to the start of construction activities, reviewing weekly health and safety updates and conducting health and safety inspections of the Keystone project.

2.1.2.3 Regulatory/Technical Officer

The ENTACT Regulatory/Technical Officer is Ms. Jenny Elste (Mr. Thad Slaughter will also assist on this project). The Regulatory/Technical Officer will provide regulatory and technical support to the Field Project Manager and On-site QA/QC Officer in the areas of solid and hazardous waste management, material sampling, and any other regulatory or technical requirements for the corrective measures. The Regulatory/Technical Officer and the QA/QC Officer will also be responsible for the validation of all data received from the analytical laboratory.

2.1.2.4 Project Engineer

The ENTACT Project Engineer is Mr. Chris Preston, P.E. The Project Engineer will provide technical support to the Field Project Manager in the areas of engineering design, backfill placement, cover system installation, and any other design requirements associated with the corrective measures. Specific responsibilities will include, but are not limited to, the following:

- Provide technical support and direction for the implementation of the required corrective measures; and
- Provide assistance in the modification of technical requirements of the corrective measures, if different than technical requirements provided in the approved CMI Workplan.

2.1.2.5 Field Project Manager

ENTACT's Field Project Manager is Mr. Brent Hays. The Field Project Manager will be responsible for directing all site personnel, equipment, subcontractors, and activities to ensure the successful implementation of the corrective measures. Specific responsibilities of the Field Project Manager will include, but are not limited to, the following:

- Supervise field activities and ensuring that the construction activities are executed in accordance with the CMI Workplan and in strict accordance with the *Site-specific Health and Safety Plan*;
- Ensure that adequate resources are available on-site to complete the required tasks;
- Ensure ENTACT associates and qualified subcontractors are properly trained in the safe performance of the tasks which they are assigned;
- Ensure that required record-keeping and project record documents and other related documents are maintained on-site;
- Assist others in the planning, coordination of field activities and implementation of the corrective measures;

- In response to modified or unforeseen field conditions, redirecting the sequence of required site work and specifics of work procedures and protocols to accomplish task objectives in the most efficient and safe manner possible;
- Ensure that required quality assurance/quality control procedures are properly implemented and documented;
- Ensure that the corrective measures are completed with the approved schedule;
- Ensure effective communications with the U.S. EPA's PM;
- Ensure that all documents and reports that ENTACT is required to generate meet the requirements of the approved CMI Workplan;
- Communicate any request for modifications to the approved CMI Workplan to the U.S. EPA PM; and
- Promptly notifying the U.S. EPA's PM in the event unforeseen field conditions and/or problems are encountered.

2.1.2.6 On-Site Health and Safety Officer

ENTACT's On-site Health and Safety Officer is Mr. Brent Hays. The On-site Health and Safety Officer will be responsible for the coordination of on-site health and safety issues with ENTACT's Corporate Health and Safety Director. Specific on-site health and safety duties will include, but are not limited to, the following:

- Monitor work at all times or designating a suitably qualified alternate;
- Ensure that site workers and other authorized personnel have read and understand the *Site-specific Health and Safety Plan*;
- Ensure that site workers and other authorized personnel possess the required documentation of their safety training and medical monitoring;
- Conduct daily safety meetings and more extensive safety meetings to be held at the start of new and/or potentially dangerous project activities;
- Ensure that required air monitoring is being conducted in accordance with the approved Workplan and the *Site-specific Health and Safety Plan*;
- Correct or discontinue any potentially unsafe work practices or site conditions, and, if necessary, stop work if unsafe conditions or practices are encountered and not corrected or discontinued;
- Prepare safety reports and other health and safety documentation; and

- Communicate any concerns or health and safety issues with the Field Project Manager and ENTACT's Corporate Health and Safety Officer.

2.1.2.7 On-Site Quality Assurance/Quality Control Officer

ENTACT's On-site Quality Assurance/Quality Control (QA/QC) Officer is Mr. Aaron McCorvey. The On-site QA/QC Officer will be responsible for performing required sampling and quality control testing during the corrective measures and will operate independently of ENTACT's Field Project Manager. The QA/QC Officer will communicate any QA/QC issues related to the project to the Field Project Manager and Regulatory/Technical Officer. The QA/QC Officer will have the authority to correct and implement additional measures to assure compliance with the approved workplan, including the *Quality Assurance Project Plan* (QAPP). Specific responsibilities will include, but are not limited to, the following:

- Adhere to the approved QAPP;
- Ensure required quality assurance/quality control procedures are properly implemented and documented;
- Document any deviations to the plan with a justification for the deviations, and, if necessary, appropriate notification in accordance with the approved *CMI Workplan*;
- Secure necessary sampling tools, bottles, packaging/shipping supplies, chain-of custody documents, etc. in accordance with the approved *CMI Workplan*;
- Collect or direct the collection of samples and ship samples at the frequencies and for laboratory analysis parameters specified in the QAPP;
- Document the location, time and date of all samples that are collected and shipped to the laboratory;
- Interface with the Field Project Manager such that the sample collection is coordinated with the general progression of work;
- Notify the Field Project Manager and the U.S. EPA of any sampling activities associated with the implementation of the approved *CMI Workplan*;
- Obtain and evaluate laboratory analytical results and field geotechnical results. Report the data to the Field Project Manager and Regulatory/Technical Officer; and
- Approve or disapprove of materials supplied and installation procedures.

2.2 Management Control Process

The ENTACT Project Coordinator has the overall responsibility for successfully completing the corrective measures at the facility. This includes achieving compliance with the AOC, Statement of Basis and the CMI Workplan in a safe manner by fulfilling contractual obligations and meeting the established

project schedule and budget. The Project Coordinator will accomplish these objectives by monitoring the progress of work activities, reviewing and planning each project task with experienced technical staff and the Field Project Manager, and ensuring that the appropriate and sufficient resources are available to the Field Project Manager and the On-site QA/QC Officer.

The Field Project Manager will receive daily progress reports from site personnel apprising him of the status of planned, ongoing and completed work, including QA/QC performance, health and safety and site-specific issues. In addition, the Field Project Manager will be apprised of any potential problems and recommendations for solutions and/or corrective actions.

2.3 Project Organizational Chart

Figure 3 illustrates the lines of authority and communication of the corrective measures management team for overseeing and implementing the required corrective action activities at the Keystone facility. Qualifications and experience of ENTACT's management team are provided in this section. In an effort to facilitate effective communication within the field during the implementation of the corrective measures, U.S. EPA will discuss issues concerning day-to-day field activities with ENTACT's Field Project Manager.

3.0 CORRECTIVE MEASURES

3.1 Mobilization and Site Preparation

Following approval of the CMI Workplan, ENTACT will mobilize to the facility and prepare the areas for work activities. Mobilization activities will include, but are not limited to, the following:

- Preparing the necessary notifications, permits and submittals;
- Mobilizing personnel, equipment and temporary facilities;
- Implementing the *Site-specific Health and Safety Plan* for remedial work;
- Installing erosion, sedimentation and stormwater control measures;
- Constructing work zones, equipment decontamination areas and material staging areas;
- Identifying utility lines, including gas, electric, telephone fiber and wire, storm and sanitary sewers, water, and cable; and
- Establishing support facilities.

3.1.1 Notifications, Permits and Submittals

The necessary notifications have been filed with the appropriate agencies concerning the implementation of corrective measures associated with the F-Pond and North Ditch Staging Area. The following notifications and permits have been obtained for the corrective measures work: 1) Approval from the U.S. Army Corps of Engineers (ACOE) for coverage under Nationwide Permit 38, Cleanup of Hazardous and Toxic Waste, for the F-Pond corrective measure; 2) Approval from the Illinois Department of Natural Resources to excavate soils from the F-Pond under Permit No. DS2005075; 3) A waiver from the IEPA to obtain a 401 Water Quality Certification for the work associated with the F-Pond corrective measure; and 4) Approval for coverage under the General National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharges from Construction Site Activities (Permit No. ILR10D151) for the F-Pond and North Ditch Staging Area corrective measures. A Stormwater Pollution Prevention Plan (SWPPP), as described in the NPDES General Permit, has been prepared and is included as Appendix A to this CMI Workplan.

3.1.2 Health and Safety

A *Site-specific Health and Safety Plan* has been developed for the implementation of the corrective measures at the site. All personnel involved in the corrective measures will thoroughly understand and acknowledge the essential elements of the *Site-specific Health and Safety Plan* prior to the start of on-site activities. In accordance with the Plan, at the initiation of the corrective measures, an orientation session will be held for all ENTACT associates and subcontractors working at the facility. In addition, daily

health and safety meetings will be held on specific topics, visitor protocols, and ongoing activities throughout the duration of the corrective measures.

3.1.3 Support Facilities

Project mobilization and site preparation activities will include establishing administrative support facilities, supply storage areas, decontamination areas, and staging areas for excavated materials. Support facilities will be located at the northwest portion of the Temporary Container Storage Area maintained by Keystone.

Temporary office facilities will be utilized during the corrective measures. Utility service will be connected to support administrative operations. The facility will be equipped with computer systems, facsimile capability, and telephone service. Necessary project plans, drawings and supporting documentation will be maintained in the temporary office facility. Portable sanitary facilities will be provided at the support facilities for field personnel.

Equipment and supply storage areas will be established adjacent to the appropriate work areas or support facilities. Personnel and equipment decontamination areas will be constructed and identified in accordance with the *Site-specific Health and Safety Plan* requirements. A parking area will be established at the support facilities for on-site personnel.

3.1.4 Work Zones

Work zones will be established and enforced during the corrective measures activities. These zones will be demarcated using signs, barricade tape, fencing, and/or other physical barriers. The work zones will include the exclusion zone, contamination reduction zone and support zone.

The Exclusion Zone will consist of the treatment, excavation and staging portions of work areas, as applicable. Specific locations of the Exclusion Zone may be modified based on the progress of work activities to each portion of the facility.

The Contamination Reduction Zone will consist of personnel and equipment decontamination areas constructed in a central location adjacent to work areas. A personnel decontamination area will be located adjacent to the support facilities for personnel and visitors to don and doff their personal protective equipment. The personnel decontamination area will be equipped with water and personal protective equipment storage. Additional personnel decontamination areas may be located at the F-Pond and North Ditch Staging Area given the distance between the units and the support facilities location. Vehicle inspection and decontamination areas will also be constructed at each unit, as needed. These areas will be equipped with brooms, hand tools and/or high-pressure washers for the decontamination of vehicle tires and undercarriage members. The location of the Contamination Reduction Zone may be adjusted during certain phases of work to provide adequate protection of site personnel and proper decontamination of equipment and vehicles. All decontamination procedures will adhere to methods outlined in the *Site-specific Health and Safety Plan.*

The Support Zone will be recognized as the support/administrative facilities, sanitary facilities and parking areas. These areas will be clearly marked with appropriate signs for identification purposes.

3.1.5 Vehicle/Equipment Decontamination Stations

Vehicle/equipment decontamination stations will be established at each unit. The decontamination stations will consist of a gravel pad large enough to accommodate a transport vehicle. Dry decontamination methods using brooms and other hand tools will be used to remove soil residuals from the tires, tracks and undercarriage members. In the event that dry decontamination methods are not effective in removing the residuals, wet decontamination methods using high-pressure washers will be employed. Residuals removed from vehicles that have come into contact with contaminated media will be collected and consolidated with sediments/soils that will be disposed off-site. Rinse waters will be collected, if present, and transferred to the facility's wastewater treatment plant for treatment and discharge. The appropriate decontamination tools will be staged at each decontamination station for the duration of the applicable work.

3.1.6 Site Security

Site security measures will be established during mobilization and site preparation activities to prevent unauthorized access to each unit and prevent the removal of materials, equipment or other items from each unit or the support facilities that are not authorized. Access to the work areas will be limited to authorized personnel through the use of temporary fencing. All entrance gates to the work areas will be secured during non-working hours. Additional security measures may be provided for the work areas depending on work activities.

Access to each unit will also be controlled by ENTACT personnel during normal working hours. All personnel and visitors requiring access to the work area will be required to visit the administrative office prior to entry. Visitors will be required to sign the Visitor Logbook prior to entry to the units.

3.1.7 Utility Identification

The identification of site utilities will be conducted by the appropriate utility location services, Keystone and ENTACT to demarcate the following utilities:

- Sanitary sewer lines;
- Condensate lines;
- Stormwater drains and systems;
- Electric lines;
- Water lines;
- Natural gas lines;

- Fiber optic lines;
- Overhead utilities; and
- Process lines.

Each utility will be identified with individual flags, signs or other devices. All identification devices will be visible and noted on a site utility drawing for reference purposes. ENTACT will coordinate abandonment procedures for utility lines, if required, with the appropriate utility companies and Keystone.

3.1.8 Erosion, Sedimentation and Stormwater Control Measures

Erosion, sedimentation and stormwater control measures will be installed at the F-Pond and North Ditch Staging Area, as necessary, prior to the start of corrective measures activities. Control measures will consist of silt fencing, stabilized construction entrances and/or earthen or hay bale berms, if needed. Installation of these mechanisms will be completed in order to reduce sediment-laden stormwater run-off from leaving the work area and prevent stormwater run-on from off-site areas from entering the work area.

Silt fencing will be installed along the downgradient edges of the work areas and around the staging areas, as needed. The silt fencing will be installed to a depth of 6 inches below ground surface in accordance with good engineering practices. Stormwater inlets, manways or other exposed subsurface inlets will be protected from stormwater flow using silt fencing or earthen berms, as appropriate.

Stabilized construction entrance/exits will be constructed at the entrances/exits to the F-Pond and North Ditch Staging Area to prevent the transfer of soil/sediment during traffic flow to and from each unit. The stabilized construction entrance/exits will be constructed of a minimum of 6 inches of compacted road base material, such as gravel, in accordance with accepted practice. Silt fencing and/or earthen berms may be installed near vehicle entrance areas along with compacted road base material.

Earthen or hay bale berms may be constructed along the upgradient or downgradient edges of each unit, depending on site conditions and project needs. If installed, the earthen berms will be constructed of clean common fill material and will be 12 to 18 inches in height. Polyethylene sheeting may be used to enclose the earthen berms and prevent the materials from washing away during rain or storm events.

A more detailed discussion of the erosion, sedimentation and stormwater control measures is provided in the *Stormwater Pollution Prevention Plan (SWPPP)* included as Appendix A to this CMI Workplan.

3.1.9 Surveying and Grid System

Prior to the start of the corrective measures activities, the limits of the F-Pond and the North Ditch Staging Area will be located in the field by a licensed surveyor. The surveyor will also locate the sampling points from the 2001 and 2002 investigations, as needed.

A grid system will be established at each unit in order to provide a system for tracking treatment, excavation and sampling activities in the field. Each unit will be staked with grid points in order to establish the grids. Grids located in the F-Pond will have a uniform square footage of approximately 2,500 square feet, but may have differing lengths or widths in order to conform to the perimeter of the unit. Grids located in the North Ditch Staging Area will be established using a 50-foot by 50-foot grid length and width. Refer to the Figures 1 and 2 of the *Field Sampling Plan,* included as Appendix B to this CMI Workplan, for a depiction of the grid system in each unit. Sampling locations will be identified, tracked and measured with the appropriate tools. The grid system will be used to provide references for the post-excavation confirmation soil sampling activities.

3.1.10 Air Monitoring

ENTACT will implement two types of air monitoring during the corrective measures. These include:

- Real-time, direct reading air monitoring using direct-reading portable data RAMs (random air monitors) to monitor particulate concentrations in the air within or at the perimeter of the work zone, as necessary; and

- Low-flow personal air monitoring using low-volume, personal air monitoring units and 37 mm cassettes to monitor constituent concentrations (i.e., lead) in the air within the work zone.

Real-time, direct reading air monitoring will be conducted during the corrective measures to assess the effectiveness of engineering controls in reducing visible dust emissions. Real-time air monitoring readings will be collected from the downwind location at the each unit on an hourly basis. The real-time air monitoring action level of 250 $\mu g/m^3$ will be observed.

Low-flow air monitoring will be conducted for the health and safety of on-site workers in accordance with the requirements of the *Site-specific Health and Safety Plan.* Action levels for personal air monitoring of constituent concentrations in the work zone will be observed as described in the *Site-specific Health and Safety Plan.* Personal air monitoring will be discontinued based on the analytical results and at the discretion of the Corporate Health and Safety Director

Corrective actions will be implemented when the daily air monitoring trigger level is exceeded. The source will be evaluated to determine the adequacy and effectiveness of work practices and dust control measures. If the evaluation determines that additional measures are required to reduce fugitive dust emissions, then corrective action, i.e. dust control measures, will be implemented. If necessary, ENTACT will modify the dust control measures to incorporate more aggressive dust control activities. The occurrence of the exceedance and the corrective measure implemented to reduce or eliminate the source of the exceedance will be documented by the ENTACT Field Project Manager or QA/QC Officer.

3.1.11 Dust Suppression

During all phases of the corrective measures, airborne dust emissions will be controlled. Dust suppression systems will be installed in areas disturbed to minimize or reduce the generation of visible dust emissions. Engineering controls for dust suppression will consist of the following methods: the use

of water misting and spraying devices, water trucks and street sweepers; use of a decontamination station for equipment and vehicles; use of wind dispersion controls; and reducing or stopping work during high wind conditions.

Dust suppression will use a quantity of water that will be sufficient enough to control dust but not enough to leave residual water accumulations on the ground surface. A 2,000 to 3,000-gallon capacity water truck will be used to wet haul routes to prevent the generation of dust during material transfer operations. To ensure that dust suppression systems are effective, real-time air monitoring will be utilized during work activities. Work procedures and/or dust controls will be adjusted as needed to ensure that visible dust is reduced or eliminated at the work zone boundary and that the real-time particulate dust daily average will not exceed an action level of 250 ug/m^3.

3.1.12 Project Meetings

Bi-monthly meetings will be conducted with representatives of ENTACT, Keystone and/or U.S. EPA to discuss the corrective measures activities performed during the previous 2 weeks and any problems or resolutions associated with previous or future work activities. The bi-monthly meetings will be conducted at the Keystone field office trailer or via a conference call. ENTACT will document the items discussed in the meetings and will forward a copy of the meeting minutes to each party in attendance.

3.2 F-Pond Corrective Measure

Corrective measures activities at the F-Pond will encompass the following areas:

- The area within the unit perimeter depicted on Figure 2 of the *Revised Final Corrective Measures Proposal, Revision 1.0* dated April 12, 2005.

3.2.1 Surface Preparation

Minimal clearing of trees, brush and undergrowth will be performed at the F-Pond prior to the initiation of the corrective measure. Trees and vegetation located around the perimeter of the F-Pond work area will be removed, as needed, and relocated to an on-site area designated by Keystone.

3.2.2 Dewatering

The F-Pond will require dewatering, if water is present, prior to the start of the corrective measure to enable the removal of contaminated sediments and soils. A sample will be collected from the water to determine the nature and concentration of the contaminants of concern for discharge purposes. Specifically, the contaminants of concern identified during the previous investigations, i.e. lead, iron, manganese, and trichloroethylene (TCE), will be analyzed for as described in the *Field Sampling Plan* included as Appendix B to this CMI Workplan. Based on the sample results, the water contained in the F-Pond will be transferred to the facility's wastewater treatment plant for treatment, if needed, and discharged under the facility's industrial discharge permit. This discharge will be conducted by Keystone in compliance with the limits established in the NPDES industrial discharge permit.

A vacuum truck or equivalent will be used to transfer the water from the F-Pond to the wastewater treatment plant. The F-Pond will be dewatered to the level necessary to facilitate the collection of sediment/soil samples and allow heavy equipment to operate in the area.

Stormwater that may collect in the F-Pond during the corrective measure will be discharged through the established erosion and sediment control measures installed pursuant to General National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharges from Construction Site Activities (Permit No. ILR10D151).

If needed, a berm will be constructed at the southern edge of the F-Pond to prevent potential floodwaters from Long Lake and the Illinois River from entering the work area during the corrective measure. The berm will be constructed of soil material obtained from the on-site borrow source and will be approximately 2 feet in height and 20 feet in width or as needed.

3.2.3 Identification of the F-Pond Limits

Prior to the start of the corrective measure, a licensed surveyor will identify the limits of the F-Pond, including the locations of the sample points from the 2001 sampling event. The limits of the F-Pond and the sample points will be located based on data provided in the *Environmental Indicators Assessment Report* dated January 2002. The approximate 2,500 square foot grid areas will then be established in the surveyed areas (see Figure 1 of Appendix B, *Field Sampling Plan,* for the grid pattern).

3.2.4 Identification of Characteristic Sediment/Soil

After the completion of dewatering activities, ENTACT will collect sediment/soil samples from each grid to determine if any of the soil/sediment exhibits the toxicity characteristic for lead (>5 parts per million (ppm)). A composite sample consisting of 5 parts will be collected from each grid. One part of each composite will be collected from each of the four corners (within 5 to 10 feet of the corner) and from the center of the grid from a depth of 0 to 6 inches below ground surface. The individual samples will then be homogenized and an aliquot of the composite sample will be submitted for analysis of TCLP lead. Additional samples will be collected from the grids for delineation purposes and will be submitted for analysis of total lead and iron. An x-ray fluorescence (XRF) field screening unit may be used to assist in the delineation of total lead and iron concentrations.

Samples will not be collected from grids 1, 2, 12, 13, 26, and 31 for total lead and iron analysis based on the results of previous sampling activities, as depicted on Figure 1 of Appendix B, *Field Sampling Plan*; however, samples will be collected for TCLP lead analysis from these grids to determine if the sediment/soil exhibits the toxicity characteristic for lead. Grids 1, 2, 26, and 31 will be remediated to meet the F-Pond remediation goals and to meet a TCLP lead concentration of <5 ppm. Grids 12 and 13 will only be remediated if TCLP lead results indicate that the concentrations are >5 ppm.

Based on the results of the characterization sampling, grids with sediment/soil with TCLP lead concentrations that exceed 5 ppm will be treated in-situ, within the footprint of the F-Pond, to render the sediment/soil non-hazardous, when generated; excavated to achieve the remediation goals; and disposed off-site as non-hazardous waste, as described in the following sections. The remaining grids with total

lead and iron concentrations that exceed the remediation goals, i.e. 800 mg/kg total lead and 100,000 mg/kg total iron, will be excavated for off-site disposal as non-hazardous waste. Characterization sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.2.5 In-situ Treatment and Stabilization

F-Pond sediments and soils that have been determined to exhibit the toxicity characteristic for lead, i.e. >5 ppm TCLP, will be treated in-situ within the footprint of the F-Pond to render the sediment/soil non-hazardous when generated, i.e. <5 ppm TCLP lead. Based on ENTACT's experience with the treatment of soils/sediments at sites with similar characteristics, triple superphosphate (TSP) will be used to treat the soils/sediments. The appropriate ratio of TSP, approximately 2 to 5% by weight of the material to be treated, will be combined with the sediment/soil in each impacted grid and mechanically mixed using a hydraulic excavator. The treated soil will be then be sampled in place, in volumes of approximately 300 cubic yards, within the treatment area for characterization purposes. The material will not be removed from the treatment area until the analytical results confirm that the sediment/soil no longer exhibit the toxicity characteristic for lead and will not be considered hazardous waste when generated.

Composite samples will be collected from each 300 cubic yard volume for characterization purposes. The sample will consist of a 4-part composite and will be submitted to an analytical laboratory for analysis of TCLP lead. Upon the receipt of analytical results which indicate that the TCLP lead concentration is <5 ppm, the treated sediment/soil will be loaded into trucks for transport for off-site disposal. Treated material that does not meet the appropriate criteria will be subject to re-treatment and re-sampling in place to verify that the treatment criteria have been achieved. Characterization sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

Wet impacted sediment/soil with total lead and iron concentrations which exceed the remediation goals for the F-Pond will be stabilized in place, as needed, to remove free liquids prior to transportation for off-site disposal. Key-lime soil conditioner will be used as the stabilization agent. The appropriate amount of soil conditioner will be mixed with the wet impacted sediment/soil to remove the free liquids. A hydraulic excavator and front-end loader will be used to accomplish stabilization. Samples will be collected from the stabilized material, at a frequency of one sample per 10,000 cubic yards or a minimum of one sample per day of stabilization, to determine compliance with 40 CFR §265.314. The samples will be analyzed using the Paint Filter Liquids Test by U.S. EPA Method 9095B.

3.2.6 Excavation

Sediment/soil which exhibits the toxicity characteristic for lead will be treated in-situ, as previously described, characterized for disposal purposes, and excavated. The treated sediment/soil will be excavated using hydraulic excavators and/or other conventional equipment to a ½ foot below the depth at which the original sample was collected that indicated that the TCLP lead concentration in the sediment/soil exceeded 5 ppm.

Post-excavation confirmation samples will be collected from the excavated surface of the grid to document that the sediment/soil which exhibited the toxicity characteristic for lead was removed. One composite sample consisting of 4 parts will be collected from the grid bottom. The individual samples collected for the composite will be homogenized and an aliquot of the composite sample will be submitted to a laboratory for analysis of TCLP lead. If the post-excavation confirmation sample analytical results indicate that concentrations of TCLP lead exceed 5 ppm, then in-situ treatment and excavation will continue until the TCLP lead concentration is below 5 ppm.

Sediment/soil with total lead and iron concentrations that exceed the remediation goals for the F-Pond, i.e. 800 mg/kg total lead and 100,000 mg/kg total iron, will be excavated to the depth required to achieve the remediation goals. Excavation activities will be conducted using hydraulic excavators and/or other conventional equipment. The extent of excavation may be guided by the use of an XRF field screening unit and would be considered initially complete when the remediation criteria are achieved at all locations, as determined by XRF field screening.

Once field screening with the XRF indicates excavation activities are initially complete in each grid, post-excavation confirmation samples will be collected from the excavation bottom and sidewalls, if present, of each grid to document that the remediation goals have been achieved. One sample will be collected from each grid bottom and each grid sidewall, if present, as depicted on Figure 1 of the *Field Sampling Plan*. The samples will be submitted to a laboratory for analysis of total lead and iron. If the post-excavation confirmation sample analytical results indicate that elevated concentrations of any of the constituents of concern are present above the remediation goals, then excavation will continue until the remediation goals are achieved.

Upon the receipt of analytical results which indicate that the remediation goals have been met, a post-excavation survey will be completed for each grid to verify the depth of excavation. The survey data will include the grid location, the elevation data and the date of survey.

Confirmation sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.2.7 Off-site Transportation and Disposal

Excavated soils will be loaded into trucks for transport to the Subtitle D disposal facility for disposal as non-hazardous waste. Conventional equipment, such as front-end loaders and hydraulic excavators, will be used to load the soils into the transport vehicles. Transport vehicles will not be loaded in excess of the approved axle rating and care will be taken to prevent the spread of dust and/or contamination of vehicles during loadout.

Transport vehicles that were exposed to visible accumulations of soil during loadout will undergo decontamination procedures. Dry decontamination procedures will be implemented in order to remove soil residuals from the truck tires and undercarriage members, i.e. truck tailgates and side boards will be swept clean using brooms and other hand tools. (Residuals removed from vehicles that have come into contact with contaminated media will be collected and consolidated with sediments/soils that will be

disposed off-site). An inspection of the vehicle will be conducted to ensure that no contaminated material or soils will be tracked off-site. If necessary, wet decontamination procedures will be implemented to further reduce or eliminate off-site tracking of mud or dirt from the site if dry decontamination is determined to be ineffective. In addition, tailgate locks and cover tarps will be inspected to ensure that they are secure and will prevent the release of soil during transport.

The appropriate documentation, i.e. non-hazardous waste manifests, will accompany each load of excavated sediment/soil to the Subtitle D disposal facility. The waste manifest will provide space for identifying the nature of the material being transported, the date and time that the material leaves the site, the truck identification number, and the weight/volume or estimated weight/volume transported will be provided with each loaded truck. The manifest form will be signed by a representative of Keystone or a representative of ENTACT, on behalf of Keystone, before the material leaves the site; by the truck driver before the truck leaves the site; and by a representative of the facility when the load is received at the disposal facility. Upon receipt of the material, the disposal facility will be required to send one copy of the manifest, completed with all appropriate signatures, to ENTACT/Keystone.

3.2.8 Restoration

The excavations from which impacted soils are removed will be restored pursuant to the requirements of the Nationwide Permit 38 approved by the U.S. ACOE. Restoration of this area will include the following:

- Grading for drainage.

3.2.9 Groundwater Monitoring

A one-time groundwater monitoring program will be implemented at the F-Pond to demonstrate that there are no impacts to groundwater from the F-Pond. Two groundwater monitoring wells will be installed as close as possible to the footprint of the F-Pond in the north and west directions by a licensed well driller. Due to limited access in these areas, the wells may be slightly off-set from these directions (see Figure 2). The existing groundwater monitoring well, TL-4, will be replaced, as its integrity has been compromised. These three groundwater monitoring wells will then be sampled for total lead on a quarterly basis for a period of one year. After one year of successfully demonstrating that the groundwater has not been impacted by the F-Pond, the wells will be appropriately abandoned. Groundwater sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.3 North Ditch Staging Area Corrective Measure

Corrective measures activities at the North Ditch Staging Area will encompass the following areas:

- The area within the unit perimeter depicted on Figure 5 of the *Revised Final Corrective Measures Proposal, Revision 1.0* dated April 12, 2005.

3.3.1 Surface Preparation

Minimal clearing of trees, brush and undergrowth will be performed at the North Ditch Staging Area prior to the initiation of the corrective measure. Trees located within the limits of the North Ditch Staging Area work area will be removed, as needed, and relocated to an on-site area designated by Keystone.

3.3.2 Identification of the North Ditch Staging Area Limits

Prior to the start of the corrective measure, a licensed surveyor will identify the limits of the North Ditch Staging Area, including the sampling locations from the December 2002 sampling event. The limits of the North Ditch Staging Area and the sample points will be located based on data provided in the *Final Corrective Measures Proposal* dated January 2003. The 50-ft by 50-ft grid system will then be established in the surveyed areas (see Figure 2 of Appendix B, *Field Sampling Plan,* for the grid pattern).

3.3.3 Identification of Characteristic Soil

ENTACT will collect soil samples from the locations in the North Ditch Staging Area where samples were previously collected in December 2002 (see Figure 2 of the *Field Sampling Plan*, included as Appendix B to this Workplan) to determine if the soil exhibits the toxicity characteristic for lead (>5 mg/l TCLP). A grab sample will be collected from each of the December 2002 sampling locations at depths of approximately 1 to 3 feet below ground surface and will be submitted to a laboratory for analysis of TCLP lead. Based on the sampling results, soil with TCLP lead concentrations that exceed 5 mg/l will be treated in-situ to render the soil non-hazardous, when generated; excavated to achieve the remediation goals; and disposed off-site as non-hazardous waste, as described in the following sections. The remaining soils with total lead concentrations that exceed the remediation goal, i.e. 800 mg/kg total lead, will be excavated for off-site disposal as non-hazardous waste. Characterization sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.3.4 In-situ Treatment

Soils that have been determined to exhibit the toxicity characteristic for lead, i.e. >5 ppm TCLP, will be treated in-situ within the footprint of the North Ditch Staging Area to render the soil non-hazardous when generated, i.e. <5 ppm TCLP lead. Based on ENTACT's experience with the treatment of soils at sites with similar characteristics, TSP will be used to treat the soils. The appropriate ratio of TSP, approximately 2 to 5% by weight of the material to be treated, will be combined with the soil in each impacted grid and mechanically mixed using a hydraulic excavator. The treated soil will then be sampled in place, in volumes of approximately 300 cubic yards, within the treatment area for characterization purposes. The material will not be removed from the treatment area until the analytical results confirm that the soil no longer exhibit the toxicity characteristic for lead and will not be considered hazardous waste when generated.

Composite samples will be collected from each 300 cubic yard volume for characterization purposes. The sample will consist of a 4-part composite and will be submitted to an analytical laboratory for analysis of TCLP lead. Upon the receipt of analytical results which indicate that the TCLP lead concentration is <5

ppm, the treated soil will be loaded into trucks for transport for off-site disposal. Treated material that does not meet the appropriate criteria will be subject to re-treatment and re-sampling in place to verify that the treatment criteria have been achieved. Characterization sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.3.5 Excavation

Soil which exhibits the toxicity characteristic for lead will be treated in-situ, as previously described, characterized for disposal purposes, and excavated. The treated soil will be excavated using hydraulic excavators and/or other conventional equipment to a ½ foot below the depth at which the original sample was collected that indicated that the TCLP lead concentration in the soil exceeded 5 ppm.

Post-excavation confirmation samples will be collected from the excavated surface of the grid to document that the soil which exhibited the toxicity characteristic for lead was removed. One sample will be collected from the excavation bottom where the initial characterization sample was collected. The sample will be submitted to a laboratory for analysis of TCLP lead. If the post-excavation confirmation sample analytical results indicate that concentrations of TCLP lead exceed 5 ppm, then in-situ treatment and excavation will continue until the TCLP lead concentration is below 5 ppm.

Soil with total lead concentrations that exceed the remediation goal for the North Ditch Staging Area, i.e. 800 mg/kg total lead, will be excavated to the depth required to achieve the remediation goals. Excavation activities will be conducted using hydraulic excavators and/or other conventional equipment. The extent of excavation may be guided by the use of an XRF field screening unit and would be considered initially complete when the remediation criteria are achieved at all locations, as determined by XRF field screening.

Once field screening with the XRF indicates excavation activities are initially complete in each grid, post-excavation confirmation samples will be collected from the excavation bottom and sidewalls of each grid to document that the remediation goals have been achieved. One sample will be collected from each grid bottom and each sidewall, as depicted on Figure 2 of the *Field Sampling Plan,* and the samples will be submitted to a laboratory for analysis of total lead. If the post-excavation confirmation sample analytical results indicate that elevated concentrations of the constituent of concern are present above the remediation goals, then excavation will continue until the remediation goals are achieved.

Upon the receipt of analytical results which indicate that the remediation goal has been met, a post-excavation survey will be completed for each grid to verify the depth of excavation. The survey data will include the grid location, the elevation data and the date of survey.

Confirmation sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.3.6 Restoration

The excavations from which impacted soils are removed will be backfilled with clean common fill material obtained from the on-site source located to the south of the Temporary Container Storage Area. The common fill will be sampled and analyzed for total RCRA metals and total petroleum hydrocarbons, as described in the *Field Sampling Plan* and *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan, to verify that the material is acceptable for use.

The common fill material will be placed as received in the excavated grids to an elevation within 12 inches of the surrounding ground levels and graded to promote positive drainage. The common fill will be placed in horizontal lifts not exceeding 8 inches in maximum compacted thickness and each lift will be compacted by three passes of heavy grading equipment prior to the placement of the next lift. Compacted road base material will then be placed in the upper 12 inches of the excavation and graded to promote positive drainage. This area will be restored to its current condition and use, i.e. a parking lot and/or equipment/product storage area.

3.3.7 Off-site Transportation and Disposal

Treated and impacted soils that meet the applicable disposal criteria will be loaded into tandem trucks for transport to the Subtitle D disposal facility for disposal as non-hazardous waste. Conventional equipment, such as front-end loaders and hydraulic excavators, will be used to load the soils into the transport vehicles. Transport vehicles will not be loaded in excess of the approved axle rating and care will be taken to prevent the spread of dust and/or contamination of vehicles during loadout.

Transport vehicles that were exposed to visible accumulations of soil during loadout will undergo decontamination procedures. Dry decontamination procedures will be implemented in order to remove soil residuals from the truck tires and undercarriage members, i.e. truck tailgates and side boards will be swept clean using brooms and other hand tools. (Residuals removed from vehicles that have come into contact with contaminated media will be collected and consolidated with sediments/soils that will be disposed off-site). An inspection of the vehicle will be conducted to ensure that no contaminated material or soils will be tracked off-site. If necessary, wet decontamination procedures will be implemented to further reduce or eliminate off-site tracking of mud or dirt from the site if dry decontamination is determined to be ineffective. In addition, tailgate locks and cover tarps will be inspected to ensure that they are secure and will prevent the release of soil during transport.

The appropriate documentation, i.e. waste manifest and LDR notification forms, will accompany each load of soil to the Subtitle D disposal facility. The waste manifest will provide space for identifying the nature of the material being transported, the sample identification number which represents the material that has been loaded, the date and time that the material leaves the site, the truck identification number, and the weight/volume or estimated weight/volume transported will be provided with each loaded truck. The manifest form will be signed by a Keystone representative or an ENTACT representative, on behalf of Keystone, before the material leaves the site; by the truck driver before the truck leaves the site; and by a representative of the facility when the load is received at the disposal facility. Upon receipt of the material, the disposal facility will be required to send one copy of the manifest, completed with all appropriate signatures, to ENTACT/Keystone.

3.3.8 Groundwater Monitoring

A one-time groundwater monitoring program will be implemented at the North Ditch Staging Area to demonstrate that there are no impacts to groundwater from the North Ditch Staging Area. Two groundwater monitoring wells will be installed as close as possible to the footprint of the North Ditch Staging Area in the north and southwest directions by a licensed well driller (see Figure 2). These monitoring wells, in addition to two existing monitoring wells, T-6A and W-2, will then be sampled for total lead on a quarterly basis for a period of one year. After one year of successfully demonstrating that the groundwater has not been impacted by the North Ditch Staging Area, the wells will be appropriately abandoned. Groundwater sampling activities will be conducted in accordance with the procedures described in the *Field Sampling Plan* and the *Quality Assurance Project Plan* included as Appendices B and C to this CMI Workplan.

3.4 Corrective Measures Supporting Plans

3.4.1 Stormwater Pollution Prevention Plan

The *Stormwater Pollution Prevention Plan* describes the best management practices for erosion and sediment control that will be implemented to control, minimize and/or prevent the potential release of impacted soils entrained in stormwater discharges. The Plan will meet the requirements of the Illinois Pollutant Discharge Elimination System for stormwater discharges from construction activities. The *Stormwater Pollution Prevention Plan* included as Appendix A to this CMI Workplan.

3.4.2 Field Sampling Plan

The *Field Sampling Plan* discusses the sampling criteria necessary to ensure that data of sufficient quality are obtained to support corrective measures decisions. The Plan supplements the *Quality Assurance Project Plan* and addresses the sampling strategy, sampling requirements and procedures, sample handling, equipment operation and decontamination procedures, and sampling documentation. The *Field Sampling Plan* is included as Appendix B to this CMI Workplan.

3.4.3 Quality Assurance Project Plan

The *Quality Assurance Project Plan* is a site-specific plan for sample analysis and data handling. The Plan will present the analytical criteria necessary to ensure data of sufficient quality are obtained to support corrective measures decisions. The Plan will describe the quality assurance program, organization, procedures, documentation, data validation, and acceptance criteria for confirmation sampling and any other sampling required for the completion of the work. The plan will include the following sections, at a minimum: project organization and responsibility; quality assurance objectives; sampling procedures; sample custody; calibration procedures and frequency; analytical procedures; data reduction, validation and reporting; internal QC checks and frequency; performance and system audits; preventative maintenance procedures; assessment procedures for data acceptability; corrective action; and QA reports to management. The *Quality Assurance Project Plan* is presented in Appendix C to this CMI Workplan.

3.4.4 Site-specific Health and Safety Plan

The *Site-specific Health and Safety Plan* describes all procedures and criteria necessary to protect on-site personnel and area residents from the physical, chemical and all other hazards potentially posed during the implementation of the corrective measures. The Plan includes detailed descriptions of employee training, levels of protection, personal protective equipment, medical surveillance requirements, decontamination procedures, and contingency procedures in accordance with the applicable requirements of 29 CFR §1910.120. The *Site-specific Health and Safety Plan* will be submitted to U.S. EPA under separate cover.

3.5 Demobilization Activities

3.5.1 Topographic Survey and Personnel and Equipment Removal

Upon the completion of all site requirements, a final topographic survey will be performed to produce as-built drawings of the F-Pond and the North Ditch Staging Area. The topographic survey of the units will be conducted on 1-foot intervals and will include the surface areas of each unit affected by grading and removal activities.

Pending the completion of the topographic survey field activities, equipment and personnel then will be demobilized from the facility. All temporary construction facilities will be removed and all utilities will be disconnected. All related trash and debris will also be removed.

4.0 WORK PRODUCTS

4.1 Weekly and Monthly Reports

4.1.1 Weekly Work Reports

ENTACT will prepare status reports on a weekly basis to summarize activities performed at Keystone during the previous week. The weekly status reports will include a description of all work in progress, a summary of the status of each work activity, a description of any new work started, and the location of the work being performed. The weekly status report will also include the project name, project number, date, and summary of the week's weather conditions. Each weekly report will be submitted to Keystone for review.

4.1.2 Quarterly Progress Reports

Keystone will prepare written quarterly progress reports that describe the actions that have been taken place, as part of the CMI activities, during the subject quarter; summarize all sample analytical results and all other data received or generated during the CMI activities of the subject quarter; identify all documents completed and submitted as part of the CMI activities during the subject quarter; describe all CMI actions which are scheduled for the next quarter and information regarding the construction progress; identify problems encountered and resolutions implemented as part of the CMI activities during the subject quarter; and summarize any CMI Workplan modifications proposed or approved. The Keystone Project Manager will be responsible for providing the quarterly progress reports to the U.S. EPA. U.S. EPA will be notified of any change in schedule described in the quarterly progress report for the performance of any activity no later than 7 days prior to performance of the activity.

4.2 Photographic Documentation

Photographs will be taken during the corrective measures in order to serve as a pictorial record of work progress, problems and mitigation activities. ENTACT's file at the Keystone field office will contain color prints, labeled with the date and subject of the photograph. Negatives will also be stored in a separate file in chronological order. Digital photographs will be saved to the computer file and labeled as appropriate. Photographic reporting data sheets, where used, will be cross-referenced with observation and testing data sheet(s) and/or construction problem and solution data sheet(s). Photographic documentation will also be included in the Corrective Measures Completion Report.

4.3 Progress Meetings

During the implementation of the corrective measures, at a minimum, the following meetings will be conducted at Keystone:

- Bi-monthly progress meetings.

The bi-monthly meetings will be conducted at the Keystone field office trailer or via a conference call. ENTACT will document the items discussed in the meetings and will forward a copy of the meeting minutes to each party in attendance.

4.4 Emergency Notification

Upon the occurrence of any event during the performance of the corrective measures that ENTACT is required to report pursuant to CERCLA Section 103, 42 U.S.C. 9603, or Section 304 of the Emergency Planning and Community Right-to-Know Act, 42 U.S.C. 11004, ENTACT will notify the U.S. EPA within 24 hours of the onset of the event.

4.5 Corrective Measures Completion Report

Within 60 days following demobilization, ENTACT will submit a written report to the U.S. EPA, which documents and certifies the completion of the corrective measures activities. The Corrective Measures Completion Report will include, at a minimum, the following:

- Summary of the objectives of the corrective measures;
- Summary of the site location, description and history;
- Summary of the corrective measures conducted at the F-Pond and North Ditch Staging Area;
- Analytical results for air, soil and waste, and any validation documentation generated during the corrective measures;
- Summary of the approved modifications to the CMI Workplan;
- Summary of the schedules of actual work completion; and
- As-built drawings of the F-Pond and North Ditch Staging Area.

5.0 PROJECT SCHEDULE

The project schedule for the corrective measures activities summarizes the approximate timeframe for performance of the work. The work schedule is based on a 5-6 day, 55-65 hour workweek. The sequencing of work activities may be modified in the field depending on site conditions, work procedures, health and safety protocols, weather conditions, and other site remedial activities, i.e. remedial action activities for the units under the oversight of the Illinois Environmental Protection Agency. At this time, it is anticipated that the F-Pond and North Ditch Staging Area corrective measures will be implemented in January 2006 and completed by April 2006. Refer to Figure 4 for the estimated project schedule.

6.0 INSTITUTIONAL CONTROLS

In accordance with 35 IAC §742 Subpart J, institutional controls in the form of Environmental Land Use Controls (ELUC) will be implemented at the site because the remediation objectives are based on industrial/commercial uses. The following sections describe the ELUCs that will be implemented for the F-Pond and the North Ditch Staging Area.

6.1 Deed Recordation

ELUCs in the form of deed recordation will be implemented for each of the units. The information required pursuant to 35 IAC §742.1010 (d) will be included in the ELUC. The following restrictions will be placed in the deed:

F-Pond

- Restriction to industrial/commercial use.

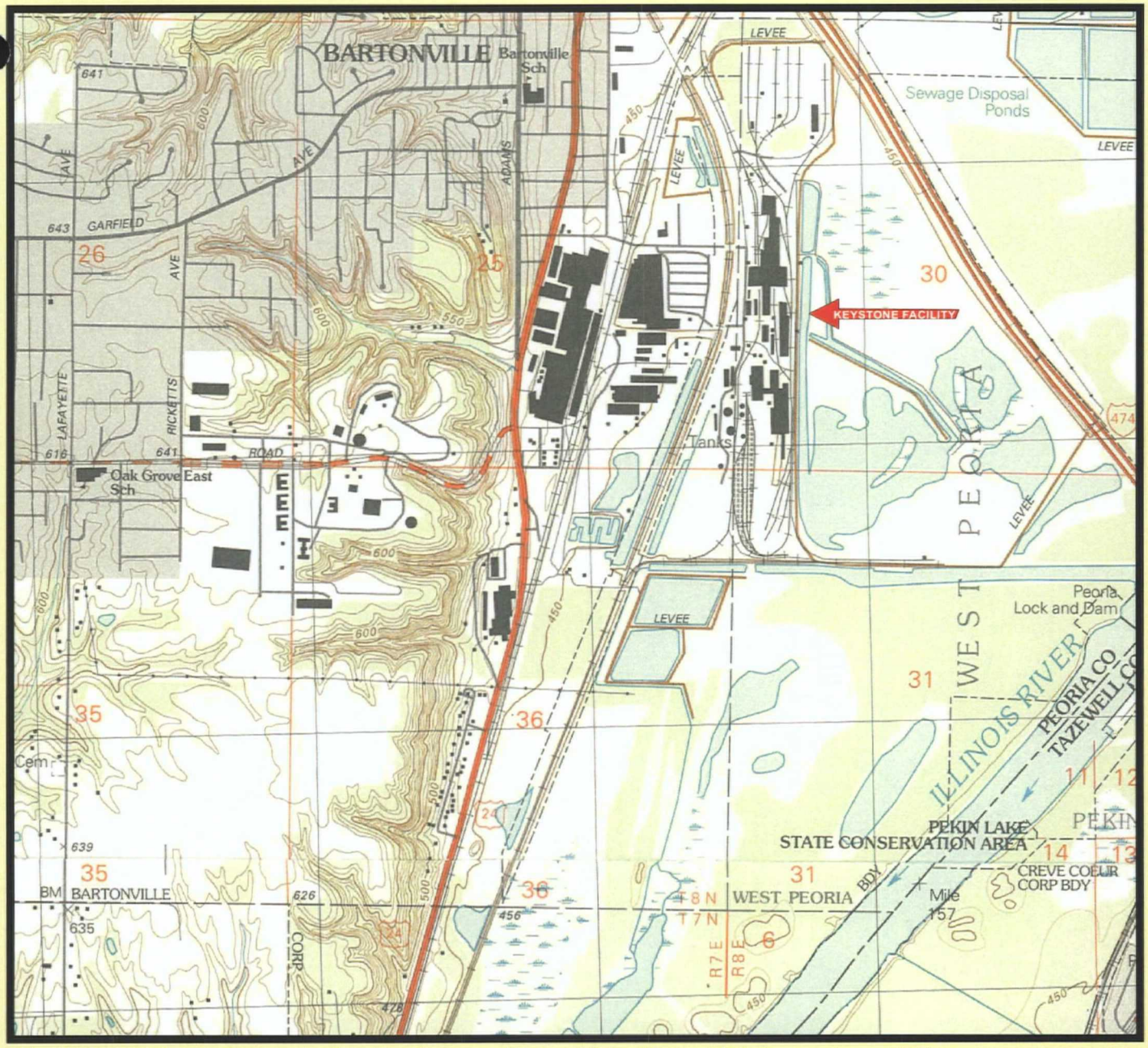
North Ditch Staging Area

- Restriction to industrial/commercial use.

The draft ELUCs will be submitted to U.S. EPA for review prior to filing with the property deed. Upon filing, a copy of the ELUC which demonstrates that it has been recorded with the Office of the Recorder or Registrar of Titles for Peoria County will be submitted to U.S. EPA for approval.

6.2 Operation and Maintenance

Operation and maintenance of the F-Pond and North Ditch Staging Area will not be required due to the off-site disposal of all contaminated sediment/soil which exceeds the remediation goals.



After U.S.G.S. 7.5 Minute Topographic Quadrangles, Peoria West and Pekin, Illinois, 1996, Contour Interval 10 feet

Scale

0 ½ 1 mile

N

Illinois

Quadrangle Location

FIGURE TITLE:	Site Location Map	**CLIENT:**	Keystone Steel & Wire Company
DOCUMENT TITLE:	Corrective Measures Implementation Workplan	**LOCATION:**	Peoria, Illinois
		DATE:	02/2005
		PREPARED BY:	DM
		SCALE:	As Shown
		CHECKED BY:	JE
		PROJECT NO:	D1154
		FIGURE NO:	1

ENTACT
4040 W. Royal Ln. Suite 136
Irving, Texas 75063
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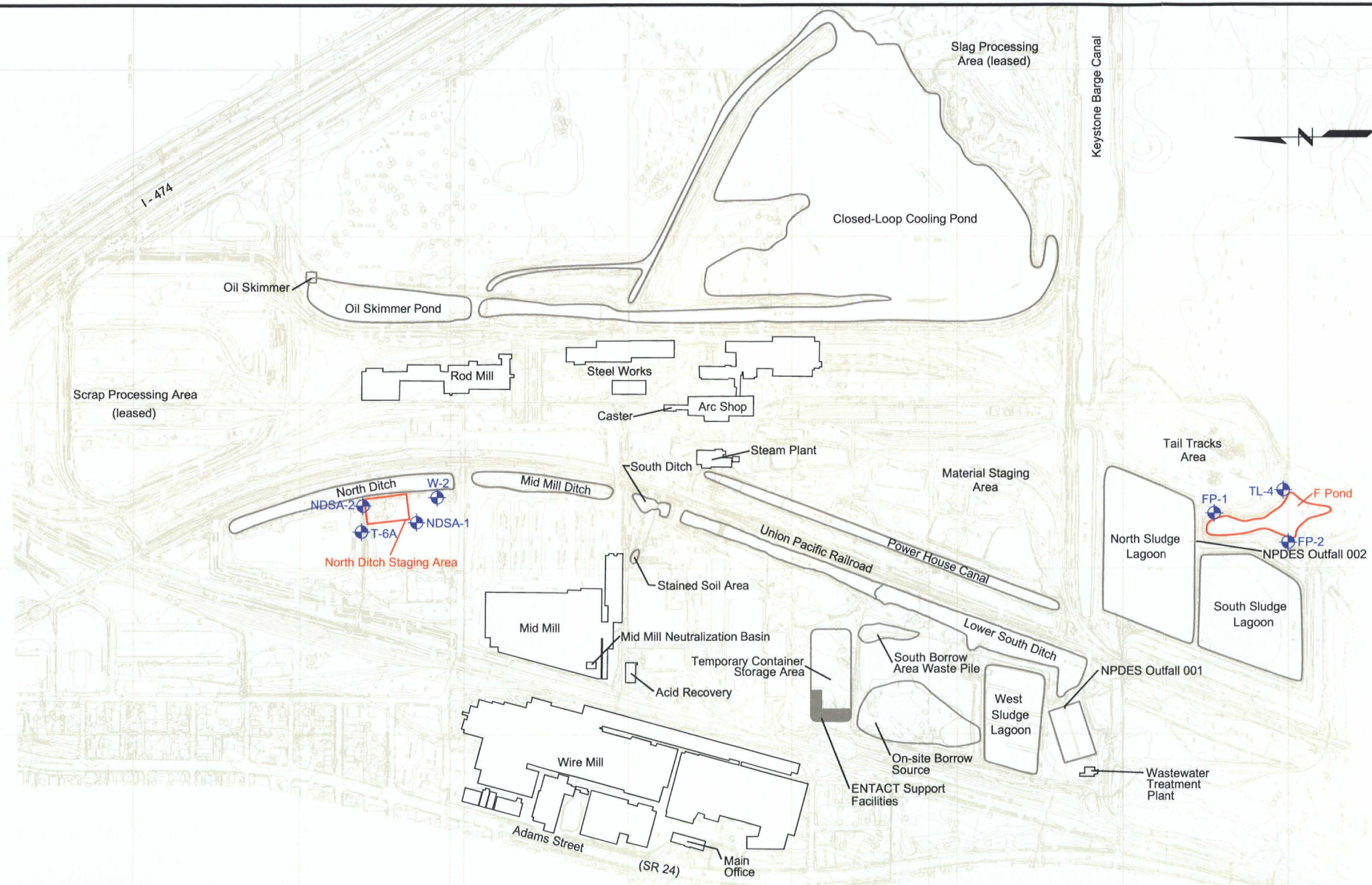


BASE MAP TAKEN FROM "REMEDIAL ACTION PLAN FOR SOUTH DITCH, SOUTH BORROW AREA WASTE PILE, AND LOWER SOUTH DITCH" DATED AUGUST 2002

P:\Projects\Keystone, Peoria, Il\Drawings\keystone-002 CMIWorkplan.dwg, entact,entact

ENTACT environmental services
3129 Bass Pro Drive • Grapevine, TX 76051
(972) 580-1323 • Fax (972) 580-7464

NO.	DATE	REVISION	APP.
Scale: 1"=600'	Drawn By: —	Checked By: —	Date: 11-24-04

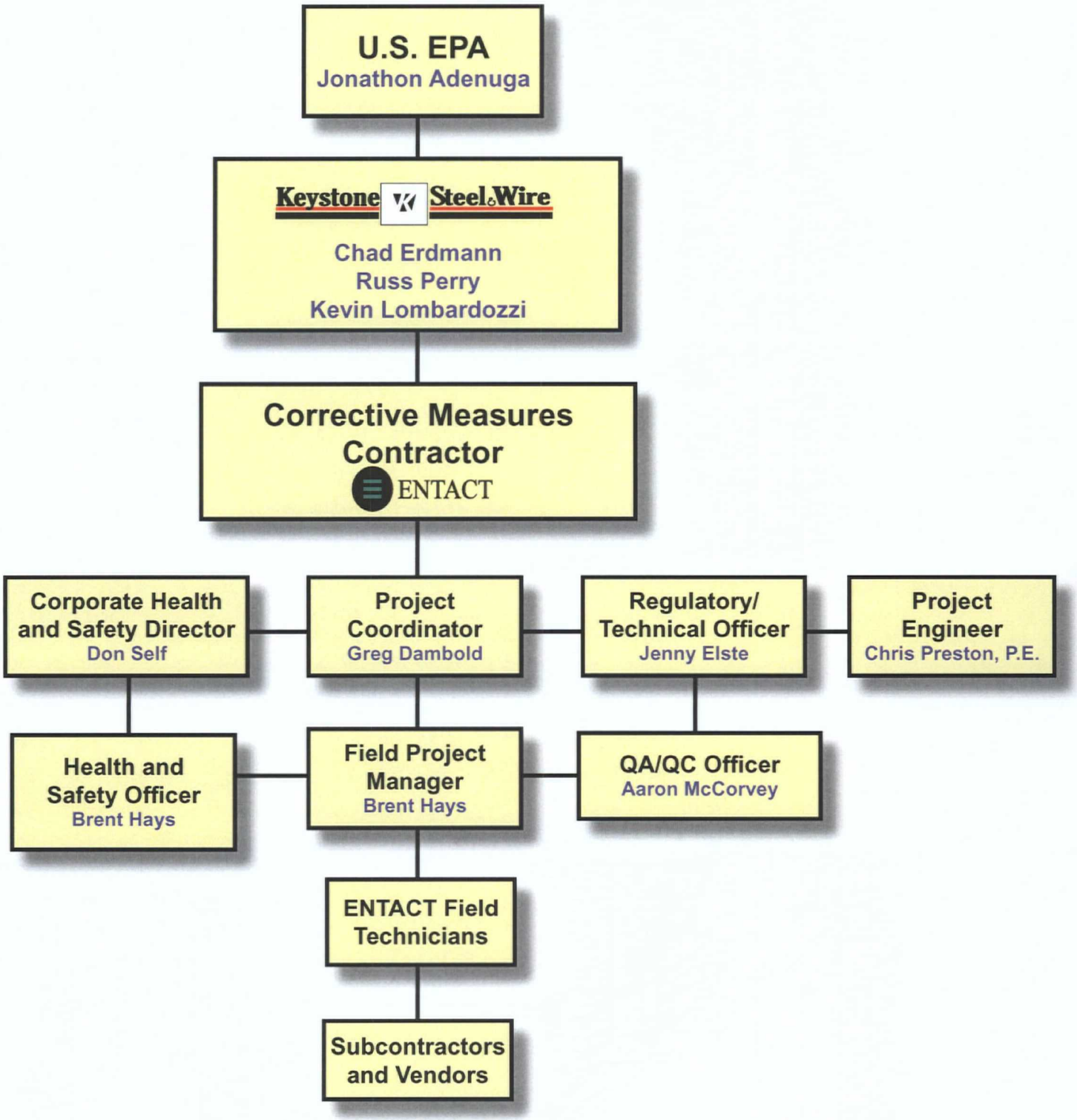
KEYSTONE STEEL & WIRE
PEORIA, ILLINOIS

FIGURE 2

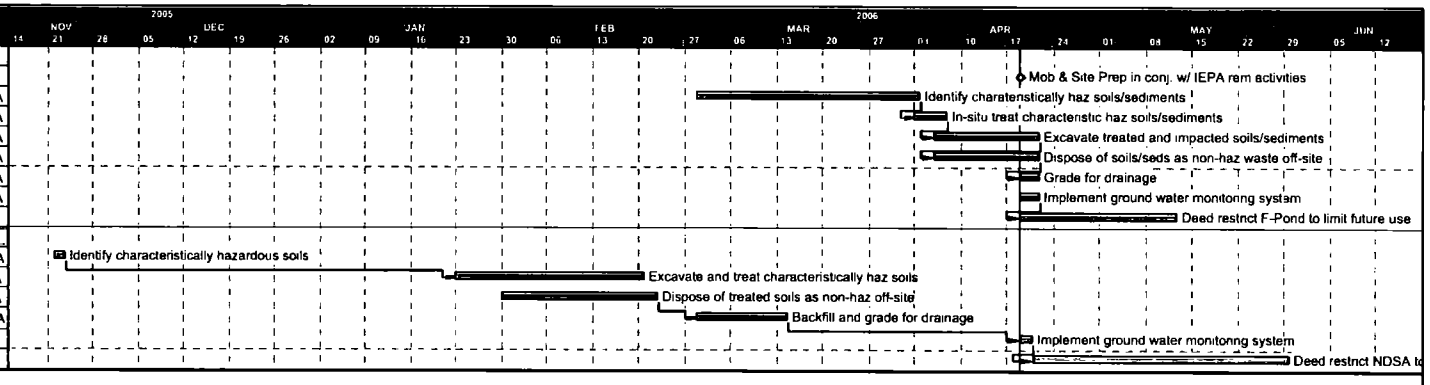
SITE LAYOUT MAP

PROJECT ORGANIZATIONAL CHART

Figure 3



Act ID	Description	Early Start	Early Finish
FPond			
900	Mob & Site Prep in conj. w/ IEPA rem activities	19APR06	
1100	Identify characteristically haz soils/sediments	01MAR06 A	03APR06 A
1200	In-situ treat characteristic haz soils/sediments	03APR06 A	07APR06 A
1300	Excavate treated and impacted soils/sediments	06APR06 A	21APR06 A
1400	Dispose of soils/seds as non-haz waste off-site	06APR06 A	21APR06 A
1550	Grade for drainage	19APR06 A	21APR06 A
1600	Implement ground water monitoring system	19APR06 A	21APR06 A
1700	Deed restrict F-Pond to limit future use	19APR06	12MAY06
North Ditch Staging Area			
2000	Identify characteristically hazardous soils	22NOV05 A	23NOV05 A
2100	Excavate and treat characteristically haz soils	23JAN06 A	20FEB06 A
2300	Dispose of treated soils as non-haz off-site	30JAN06 A	22FEB06 A
2500	Backfill and grade for drainage	01MAR06 A	14MAR06 A
2600	Implement ground water monitoring system	19APR06	20APR06
2700	Deed restrict NDSA to limit future use	21APR06	29MAY06



Start date	22NOV05
Finish date	29MAY06
Data date	19APR06
Run date	24APR06
Page number	1A

Project start date is subject to change based on completion of IEPA units.

Figure 4 Project Schedule
Keystone Steel and Wire, Peoria, IL

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

APPENDIX A

STORMWATER POLLUTION PREVENTION PLAN

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

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1.0 INTRODUCTION

This Stormwater Pollution Prevention Plan (SWPPP) has been developed for the Keystone Steel & Wire Company for its manufacturing facility located in Peoria, Illinois. This SWPPP has been prepared in accordance with the requirements of the Illinois National Pollution Discharge Elimination System General NPDES Permit for Stormwater Discharges from Construction Site Activities, Permit No. ILR10D151, dated May 30, 2003 (A copy of the permit is included in Attachment A-1).

The purpose of the SWPPP is to identify the potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site in relation to the activities described in this SWPPP. The SWPPP also describes the implementation of practices that will be used to reduce the pollutants in stormwater discharges associated with construction activities related to in-situ treatment, stabilization, excavation, and backfilling to assure compliance with the terms and conditions of the permit.

1.1 Site Location and Description

The Keystone Facility is an active facility located at 7000 SW Adams Street in Peoria County, Peoria, Illinois, as depicted on Figure 1 of the *Corrective Measure Implementation (CMI) Workplan*. The facility encompasses approximately 1,000+ acres and is located in an industrial area of southwest Peoria adjacent to the west bank of the Illinois River.

Construction and operation of the Steel Works and Wire Mill at the facility began shortly after 1900 and has operated in the same industrial mode since that time. The plant began producing steel and wire products and later (in 1950s) added the Mid Mill complex to add industrial wire production capacity. Steel was produced in open hearth furnaces until 1969 when the transition to electric arc furnaces was initiated. The last open hearth furnace was decommissioned in the 1980s and Keystone now operates two electric arc furnaces (one melting furnace and one refining furnace). All of the areas where contaminated media exist are located within the confines of Keystone's industrial complex on land that is zoned for industrial use. Operation of the property has been industrial for over 100 years and its use is anticipated to be industrial for the foreseeable future.

1.2 Site History

An Administrative Order on Consent (AOC) was established as part of U.S. EPA's implementation of the Environmental Indicators (EI) program under the Government Performance and Results Act (GPRA), as a follow-up to the original RCRA Facility Assessment (RFA) performed at Keystone in 1987. The 1989 RFA Report identified several areas of potential concern, and five of these areas were targeted for further investigation during a U.S. EPA site visit conducted in November 1999. Those five units were specifically listed in the AOC. In late summer 2001, Keystone procured new samples and analytical data at the five units identified as the Sheen Pond, F-Pond, Tail Tracks Landfill, East Pond, and Oil Skimmer Basin. The results of these investigations are described in the *Sampling Report for Environmental Indicators Assessment Investigation* submitted to U.S. EPA Region 5 on January 29, 2002. As presented

in the original January 2003 *Final Corrective Measures Proposal*, corrective action is only being required at the F-Pond.

On January 29, 2002, Keystone submitted its *Environmental Indicators Assessment Report* to U.S. EPA Region 5. This report documented Keystone's draft determination that current human exposures to contaminated soil and migration of contaminated groundwater are under control at the facility. U.S. EPA approved this determination, but also requested that Keystone perform additional sampling to confirm whether corrective measures could be necessary in some of the other areas listed in the 1989 RFA, but not included in the 2000 AOC. To address these concerns, Keystone collected additional samples at the North Ditch Staging Area, Slag Processing Area, East Waste Pond, and East Sludge Pond in fall 2002. In the fall of 2003, follow-up samples were collected in the East Waste Pond, and new samples were also collected from the North and South Sludge Lagoons.

Following its review of the new data, U.S. EPA requested that Keystone prepare a revised final corrective measures proposal to summarize the actions to be taken to protect human health and the environment from all current and future unacceptable risks that potentially could result from contaminated soil, sediment and groundwater at the facility. The Revised Final Corrective Measures Proposal for the F-Pond and North Ditch Staging Area was submitted to U.S. EPA Region 5 on February 14, 2005. Revision 1.0 to the Revised Final Corrective Measures Proposal which addressed U.S. EPA's comments and concerns was then submitted on April 12, 2005.

On October 14, 2005, U.S. EPA issued the Statement of Basis for the project which describes U.S. EPA's selected corrective measures for the F-Pond and North Ditch Staging Area. The *CMI Workplan* was developed to describe the procedures to be implemented to conduct these activities.

For reference, the areas and units discussed in this Plan are depicted on a layout map of the Keystone facility included as Figure 2 of the *CMI Workplan*.

2.0 PROJECT DESCRIPTION

The construction activities described in this SWPPP will be conducted within an approximate 3.5-acre portion of the facility. This portion of the facility consists of the F-Pond and North Ditch Staging Area.

2.1 Nature of Construction Activity

The scope of work is to achieve closure of the F-Pond and North Ditch Staging Area in accordance with the Statement of Basis. Sediment and soil that exhibits the toxicity characteristic for lead and/or exhibits elevated concentrations of total lead and/or iron will be removed from the units, as appropriate, to achieve the U.S. EPA Region 9 Preliminary Remediation Goals for industrial soils for disposal off-site as non-hazardous waste.

Soil disturbing activities are to be conducted in the F-Pond and North Ditch Staging Area over a total area consisting of approximately 3.5 acres. The extent of the surface clearing and grubbing activities and excavation activities will generally be limited to the defined limits of each unit. Best management practices for controlling sediment and stormwater run-on and run-off near the excavation areas will be implemented to control sediment/soil releases, as described in Section 3.0 of this SWPPP. A more detailed discussion of the remedial activities is provided in the *CMI Workplan* developed for the project.

2.2 Sequence of Major Activities

The selected corrective measures for the F-Pond and North Ditch Staging Area address lead and iron contamination, as appropriate, in the sediment/soil. The major components of the selected corrective measures, as presented in the remedy section of the Statement of Basis, include the following:

F-Pond

- Dewatering of the F-Pond;
- Identification of characteristically hazardous soils/sediments;
- In-situ treatment of characteristically hazardous soils/sediments, if present, to render the soils/sediments non-hazardous, when generated;
- Excavation of the treated and impacted soils/sediments to achieve the remediation goals;
- Off-site disposal of the excavated soils/sediments as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the F-Pond to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

North Ditch Staging Area

- Identification of characteristically hazardous soils;
- In-situ treatment of characteristically hazardous soils, if present, to render the soils non-hazardous, when generated;
- Excavation of the treated and impacted soils to achieve the remediation goals;
- Off-site disposal of the excavated soils as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the North Ditch Staging Area to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

The remedial action activities described above are expected to begin in January 2006 and be completed in April 2006. The exact sequence of events, i.e., the order in which the units are addressed and when they are addressed, will be dependent on several factors including subcontractor scheduling, weather and other remedial activities being performed at the site.

2.3 Site Area

Corrective measures activities will be conducted within the limits of the F-Pond and North Ditch Staging Area. These units encompass an area of approximately 3.5 acres within the 1,000+-acre facility.

The topography of the Keystone facility ranges from an elevation of 470 feet on the west side of the facility along SW Adams Street to 440 to 450 feet on the east-southeast side of the facility along the Illinois River. The topography gently slopes to the east towards the Illinois River. There are several drainage improvements present at the facility in the form of drainage ditches, culverts and stormwater collection basins. These drainage improvements are generally connected to the facility's wastewater treatment plant.

2.4 Soil Types

According to the USDA NRCS Soil Survey for Peoria County, Illinois, the following soil types are present at the site: Urban Land, Orthents-Urban Land Complex, Beaucoup Silty Clay Loam, and the Lawson Silt Loam. The Urban Land and Orthents-Urban Land Complex generally consist of areas covered by streets, parking lots, buildings, and other structures where the soils have been cut, leveled or filled during construction. Surface runoff is medium on the Orthents and rapid on the Urban Land. The soil surface layer of the Orthents consists of loam or silty loam. The underlying material consists of layers of sandy loam, clay loam, loam, or silty clay loam. These soil types are the main soil types present in the work areas.

The Beaucoup Silty Clay Loam and Lawson Silt Loam are nearly level, poorly drained soils generally found on broad flats and slight rises on floodplains along major rivers. They are frequently flooded from March to June and are subject to ponding. The Beaucoup soils consist of a very dark gray, mottled, friable silty clay loam. The Lawson soils consist of a very dark gray to black, very friable silt loam.

2.5 Run-off Coefficients

The estimated runoff coefficients for the units after remediation are as follows:

- F-Pond: 0.10 to 0.20
- North Ditch Staging Area: 0.50 to 0.60

The estimated runoff coefficients were obtained from the U.S. EPA's *Summary Guidance for Developing Pollution Prevention Plans and Best Management Practices* dated October 1992.

2.6 Name of Receiving Water

The receiving water located adjacent to the facility is the Illinois River (the facility is located within the Illinois River floodplain). Surface water at the facility, however, generally drains into a series of drainage ditches and collection basins that are connected to the facility's wastewater treatment plant. Treated water from the wastewater treatment plant is discharged under the facility's industrial NPDES permit.

3.0 PRACTICES AND MEASURES

Best management practices will be implemented during the corrective measures to prevent and/or minimize accelerated erosion and sedimentation and to control, minimize and/or prevent the release of impacted soils entrained in stormwater discharges. All erosion and sediment controls will be constructed according to the IEPA's *Illinois Urban Manual* published in 2002. The following subsections describe the best management practices that will be implemented during the corrective measures.

3.1 Good Housekeeping Practices

Good housekeeping practices will be implemented to minimize accidents and ensure a high quality of work. The following good housekeeping practices will be implemented at the Site:

- Erosion and sediment control measures will be adequately positioned, properly constructed and maintained throughout the duration of the project;
- Clearing operations will be confined to the limits of excavation or construction activity. Existing trees and other vegetation will be protected to the extent possible;
- All materials stored on-site will be stored in a neat, orderly manner in their appropriate containers or stored pursuant to the requirements;
- Erosion and sediment control measures will be effective in retaining sediments on-site;
- Stabilization practices will be effective in permanently stabilizing disturbed areas and be implemented pursuant to the requirements described in Section 3.3 of this plan;
- Corrective measures will be implemented as described in Section 4 of this plan after a deficiency is noted;
- Good housekeeping practices will be incorporated into discussions during the daily safety meetings; and
- Construction site waste materials will be properly disposed.

3.2 Structural Practices

Structural practices, consisting of erosion and sediment control measures, are designed to retain sediment on-site to the extent practicable. Structural practices will be implemented in and around the areas to be disturbed to divert upgradient stormwater flows around disturbed areas, maintain all site drainage within the excavation area, remove sediment entrained in the stormwater prior to discharge to the facility's stormwater conveyance system, and otherwise limit runoff and the discharge of pollutants from exposed areas of the site. The following structural practices may be used:

- Inlet Protection - Inlet protection barriers will be installed at the site if stormwater inlets are located near the work area to minimize sediment from entering the stormwater system drains.

- Stabilized Construction Entrances - Additional stabilized construction entrances may be installed where necessary to facilitate the removal of sediment/soil from construction equipment and transport vehicles prior to exiting the work area.

- Silt Fencing - Silt fencing will be installed on the downgradient edges of units, where feasible, to reduce stormwater velocities and prevent sediment/soil from being transported out of the unit. Silt fencing will be installed per manufacturer's specifications to ensure proper operation.

- Earthen or Hay Bale Berms - Earthen or hay bale berms may be installed on the upgradient and/or downgradient edges of units, depending on site conditions and project needs.

These erosion and sediment control measures will be installed in accordance with manufacturer's specifications, where implemented. The *Illinois Urban Manual* will be used as a guide for the proper installation of the control measures. The construction details for the above-mentioned erosion and sediment control measures described in the *Illinois Urban Manual* are incorporated by reference.

The location of the erosion and sediment control measures will be as indicated on Figures 1 and 2. Once the initial controls are in place, additional controls may be installed based on visual observations of the surface water migration pathways at each unit. In general, silt fencing will be installed on the downgradient edges of each unit or work area, as needed.

Inlet protection barriers will be placed around the stormwater drain inlets if the inlets are located within these units to prevent contaminated sediments from entering the stormwater system. Structural measures will consist of silt fencing and may include earthen or hay bale berms, as needed depending on site conditions and project needs.

Standing water present in the F-Pond before the corrective measures begin will be transferred to the on-site wastewater treatment plant for treatment, if needed, prior to discharge through the facility's industrial NPDES permit.

3.2.1 Timing of Structural Measures

The erosion and sedimentation control measures will be coordinated with the initiation of the construction phase in the areas where the corrective measures are scheduled and where material will be temporarily staged, if necessary. The erosion and sedimentation control measures may be adjusted as site conditions permit during the corrective measures at each unit. When the unit is stabilized, if applicable, the erosion and sediment control measures will be removed. ENTACT is responsible for implementation of these controls as long as ENTACT maintains day-to-day operational control of the activities necessary to ensure compliance with this Plan.

3.2.2 Sediment Management

Accumulations of sediment behind the silt fencing and other controls will be removed as necessary. These sediments will be removed prior to the completion of excavation to achieve the remediation goals and will be moved to an area undergoing in-situ treatment within the area of contamination (AOC) for the subject unit. The sediments will then be managed with the in-situ treated soils.

3.3 Stabilization Practices

Stabilization measures are designed to reduce the erosion potential of the placed soils by shielding the soil surface from direct erosive impacts, by slowing the rate of water run-off and by physically holding the soil in place. Stabilization practices will be implemented in disturbed areas as soon as practicable after the completion of final grading activities. Care will also be taken during the corrective measures to minimize the areal extent of the disturbed areas and to protect existing vegetation to the extent possible. The following stabilization practices will be implemented:

- Dust Control - Dust control will be conducted in disturbed areas and on haul roads to prevent or reduce the movement of wind-borne dust particles. Dust control will be accomplished using a water truck with a 180-degree spray-bar or high-pressure washers.

- Preservation of Existing Vegetation - Existing vegetation that will not be disturbed by the corrective measures activities will be protected to the extent possible. The preservation of existing vegetation will help to control erosion on the property.

Stabilization of the North Ditch Staging Area will not be completed by ENTACT due to Keystone's desire to place a gravel or asphalt cover on the area for use as a parking area or equipment/product storage area. The F-Pond will be stabilized per the requirements of the Nationwide Permit 38 approved by the U.S. Army Corps of Engineers and the Illinois Environmental Protection Agency (IEPA) and then allowed to return to native conditions.

3.3.1 Timing of Stabilization Measures

The stabilization practices will be coordinated with the initiation of the corrective measures activities at the affected areas.

3.3.2 Records

Records associated with the stabilization activities that will be maintained with the SWPPP include the following:

- Dates when major grading activities occur;

- Dates when construction activities temporarily or permanently cease on a portion of the site; and

- Dates when stabilization measures are initiated.

This information will be recorded on the stabilization measure inspection form included in Attachment A-2.

3.4 Stormwater Management

During the corrective measures, stormwater will be diverted from the work areas to the extent possible. Stormwater at the North Ditch Staging Area will be redirected to the facility's stormwater system through a series of pumps and hoses or via vacuum truck or similar. Stormwater at the F-Pond will be redirected to the structural best management practices for filtering prior to discharge.

Following completion of the corrective measures, stormwater will be allowed to follow the natural drainage path at the North Ditch Staging Area and F-Pond.

3.5 Other Practices

3.5.1 Off-site Vehicle Tracking

Trucks used to transport excavated soils will be required to stay on established haul roads located outside of the exclusion zone. If trucks are required to enter the exclusion zone, dry decontamination procedures will be implemented in order to remove soil residuals from the truck tires and undercarriage members, i.e. truck tailgates and side boards will be swept clean using brooms and other hand tools. An inspection of the vehicle will be conducted to ensure that no contaminated material or soils will be tracked off-site. If necessary, wet decontamination procedures will be implemented to further reduce or eliminate off-site tracking of mud or dirt from the site if dry decontamination is determined to be ineffective. In addition, all vehicles hauling materials on city streets will be tarped and covered to prevent wind dispersion of materials during transport.

The existing stabilized construction entrance/exit will be used to help reduce vehicle tracking of sediments/soils. If necessary, additional entrances/exits will be constructed. The entrance will be swept as needed to remove any excess mud, dirt or rock tracked from the Site. Any incidental soil tracked from the load-out area will be immediately cleaned up.

3.5.2 Material Staging and Waste Disposal

Contaminated soils will be maintained within the limits of the F-Pond and North Ditch Staging Area, as appropriate, until the material is loaded out for off-site disposal. Structural practices, such as silt fencing or hay bales, will be placed around the stockpiles, if needed to prevent the loss of material from the stockpiles.

All non-hazardous construction debris and general office trash will be disposed in a dumpster placed on-site. Trash receptacles will also be placed in the storage trailers for the collection of non-hazardous trash

and debris. Spent personal protective equipment will be disposed with the material that is being sent off-site.

Hydraulic oils, motor oils and lubricants will be stored in the on-site equipment storage trailer. Quantities of these items should not exceed 10 gallons. If larger quantities of these items are required to be on-hand, ENTACT will review the storage and containment of those items at such time. All appropriate health and safety requirements for storing this material on-site will be followed. In addition, a *Spill Prevention, Control and Countermeasures Plan* will be developed to manage this material and any potential release of oil/fuel(s) products used at the site.

3.5.3 Spill Prevention and Response

Pollution prevention measures will include the implementation of BMPs. If a reportable quantity of oil or hazardous material release is discovered, ENTACT will notify Keystone and the U.S. EPA. In addition, the National Response Center at (800) 424-8802 will be notified after the local authorities are notified. The U.S. EPA will be notified verbally within 24 hours and in writing within 14 days. Complete emergency response and spill cleanup procedures are detailed in the *Site-specific Health and Safety Plan*. The SWPPP will also be modified to include the date of the release, the circumstances leading to the release and the steps taken to prevent reoccurrence of the release.

3.5.4 Other Pollutant Sources

No other pollutant sources associated with the response action activities are expected within the affected property.

4.0 MAINTENANCE AND INSPECTIONS

Inspection and maintenance of the control measures have been identified as a major part of effective erosion and sediment control programs. The ENTACT Project Manager or his designee will perform inspections of the control measures at least once every 7 calendar days and within 24 hours of any storm event of greater than 0.5 inches or equivalent snowfall. The inspections will consist of a walk-through of disturbed areas and material storage and staging areas that are exposed to precipitation for evidence of, or the potential for, pollutants to enter the run-off from the site. Erosion and sediment control measures will be inspected to ensure they are functioning properly and that they are positioned adequately for the control of run-off and sediment. Stormwater inlets will be inspected for evidence of sediment accumulation or flow restriction. Locations where vehicles enter or exit the site will be inspected for evidence of off-site sediment tracking. The inspections will be documented as described in Section 5.0.

Based on the results of the inspection, the erosion and sediment control measures will be maintained, repaired or replaced as soon as possible, but not more than 7 calendar days after inadequacies are revealed. The maintenance and repair of silt fencing will be completed within 24 hours after any deficiencies are discovered. The implementation of any necessary corrective measures will also be documented as described in Section 5.0.

5.0 REPORTING AND RECORD-KEEPING REQUIREMENTS

5.1 Inspections and Maintenance Forms

Inspection results will be documented on an inspection report form and will be include the following information, at a minimum:

- Name and signature of the person conducting the inspection;
- Date the inspection was conducted;
- Findings of the inspection;
- Corrective actions taken to correct deficiencies; and
- Date the corrective action was implemented.

The inspection forms will be retained as part of the SWPPP for a period of at least 3 years after the date of inspection. Example inspection forms are included in Appendix A-2 to this SWPPP.

5.2 Construction Activities Log

Records associated with the construction activities that will be maintained with the SWPPP include the following:

- Dates when major grading activities occur;
- Dates when construction activities temporarily or permanently cease on a portion of the Site;
- Dates when stabilization measures are initiated.

This information will be recorded on the inspection forms included in Appendix A-2.

5.3 Incidence of Noncompliance Report

An Incidence of Noncompliance (ION) Report will be completed and submitted to IEPA within 5 days for any violation of the SWPPP observed during an inspection. The ION will include specific information on the cause of the noncompliance, actions that were taken to prevent any further causes of noncompliance and a statement detailing any environmental impact that may have resulted from the noncompliance. The ION will be completed on forms provided by IEPA and will be signed by the Field Project Manager.

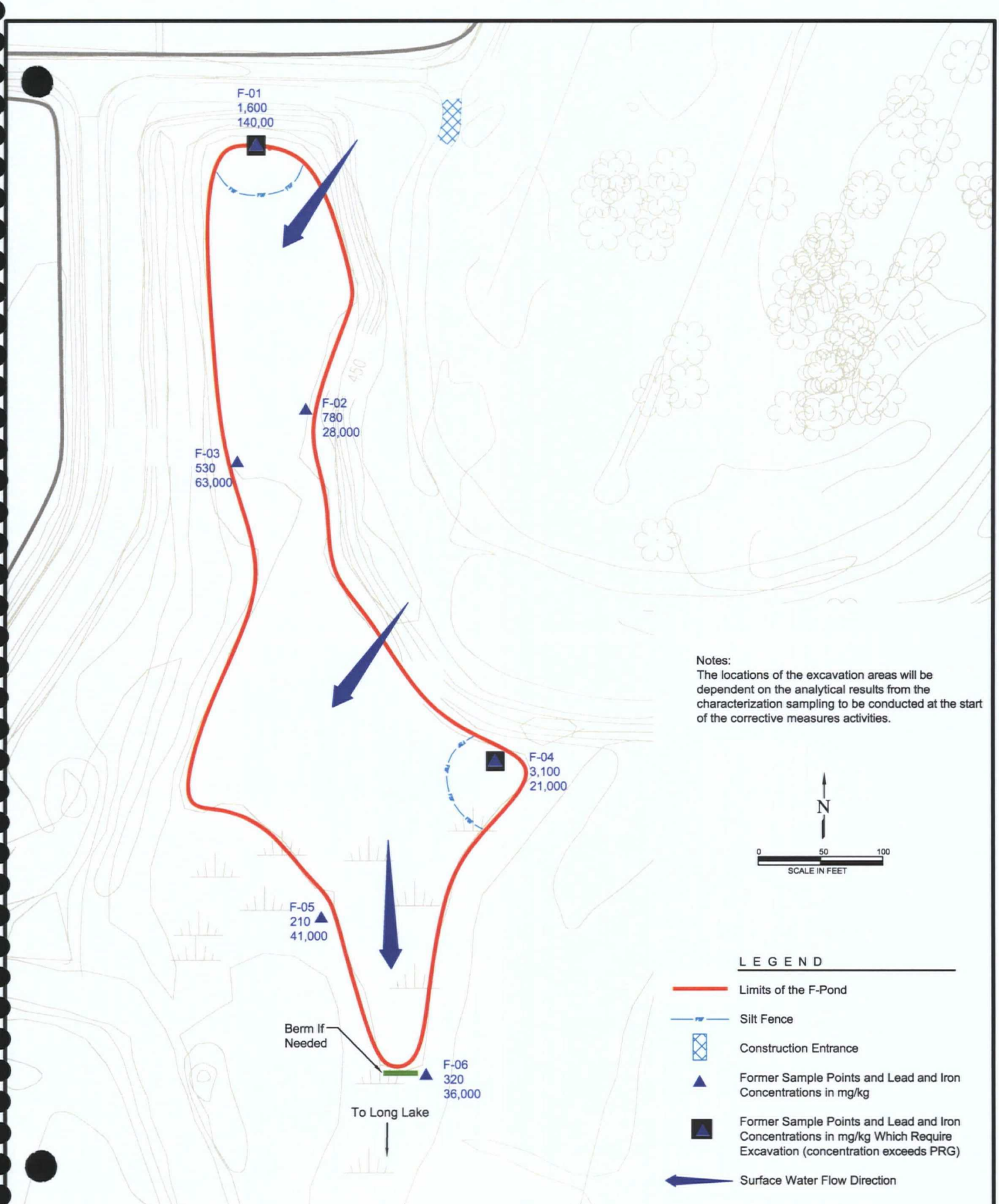
5.4 Changes to the SWPPP

This SWPPP has been prepared and will be maintained and updated to be consistent with all federal, state and local guidelines for all applicable stormwater, sediment and erosion site plans or permits. Any changes required to the SWPPP will be documented on the SWPPP form included in Appendix A-2. These forms will be maintained with the SWPPP for the duration of the corrective measures activities.

5.5 Certifications

All contractors and subcontractors working on this project and responsible for stormwater controls have agreed to maintain the provisions of this SWPPP. Contractor and subcontractor certifications will be included in Attachment A-3 of the SWPPP maintained at the project site.

FIGURES



Base map taken from "Environmental Indicators Assessment Report" dated January 2002.

F-POND EROSION AND SEDIMENT CONTROL MEASURES MAP

KEYSTONE STEEL & WIRE
PEORIA, ILLINOIS

FIGURE 1

NO.	DATE	REVISION	APP.

Scale: 1"=50' | Drawn By: — | Checked By: — | Date: 11-24-04

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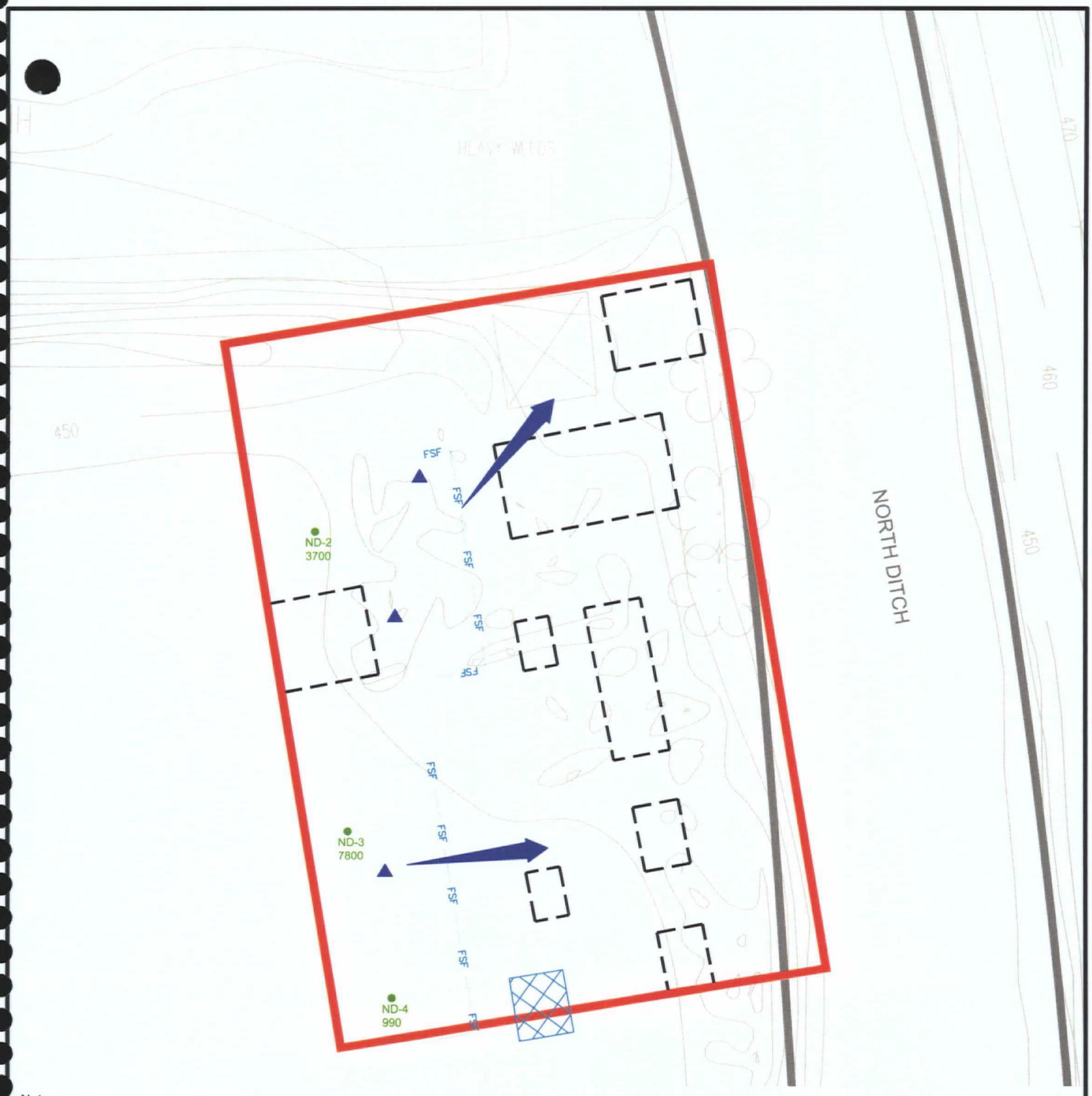
4040 W. Royal Ln. • Suite 138 • Irving, TX 75063
(972) 580-1323 • Fax (972) 550-7464
Dallas • Houston • Chicago • Atlanta

\Projects\Keystone_Peoria_II\Drawings\keystone-013 CMI SWPPP.dwg, entact entact



Notes:
The locations of the excavation areas will be dependent on the analytical results from the characterization sampling to be conducted at the start of the corrective measures activities.

LEGEND

- Limits of North Ditch Staging Area
- Locations of Former Treatment System Structures
- December 2002 Sample Locations and Lead Concentrations in mg/kg (concentration exceeds PRG)
- Former Sample Points (concentration exceeds PRG)
- Silt Fence
- Construction Entrance
- Surface Water Flow Direction

N

0 25 50
SCALE IN FEET

Base map taken from "Final Corrective Measures Proposal" dated January 2003.

NORTH DITCH STAGING AREA EROSION AND SEDIMENT CONTROL MEASURES MAP

KEYSTONE STEEL & WIRE
PEORIA, ILLINOIS

FIGURE 2

NO.	DATE	REVISION	APP.

Scale: 1"=60' | Drawn By: --- | Checked By: --- | Date: 11-24-04

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ATTACHMENT A-1

GENERAL NPDES PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION SITE ACTIVITIES (ILR10D151)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276, 217-782-3397
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601, 312-814-6026

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-0610

June 27, 2005

KEYSTONE STEEL & WIRE CO
7000 SW ADAMS ST
PEORIA, IL 61614

Re: FACILITY: KEYSTONE STEEL & WIRE COMPANY PEORIA
NPDES Permit No: ILR10D151
COUNTY: PEORIA

Notice of Coverage Under Construction Site Activity Storm Water General Permit

Dear NPDES Permittee:

We have reviewed your application and determined that storm water discharges associated with industrial activity from construction sites are appropriately covered by the attached General NPDES Permit issued by the Agency.

Your discharge is covered by this permit effective as of the date of this letter or as identified by the conditions of the permit. The Permit as issued covers application requirements, a storm water pollution prevention plan and reporting requirements.

Pursuant to the permit language, you must terminate your permit coverage once your construction project has been completed and the site is properly stabilized. Enclosed for your convenience is a copy of the Notice of Termination form. Failing to provide a timely Notice of Termination may cause you to owe additional fees.

This letter shows your facility permit number below the construction site name. Please save this number and reference it in all future correspondance. Should you have any questions concerning the Permit, please contact the Permit Section at the above telephone number and address.

Very truly yours,

Alan Keller

Alan Keller, P.E.
Manager, Permit Section
Division of Water Pollution Control

AK:med:concoverage 3

CC: Records Unit, Region 3

General NPDES Permit No. ILR10

Illinois Environmental Protection Agency
Division of Water Pollution Control
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276
www.epa.state.il.us

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

General NPDES Permit
For
Storm Water Discharges From Construction Site Activities

Expiration Date: May 31, 2008 **Issue Date:** May 30, 2003

Effective Date: June 1, 2003

In compliance with the provisions of the Illinois Environmental Protection Act, the Illinois Pollution Control Board Rules and Regulations (35 Ill. Adm. Code, Subtitle C, Chapter I), and the Clean Water Act, and the regulations thereunder the following discharges are authorized by this permit, in accordance with the conditions and attachments herein:

Toby Frevert, P.E.
Manager
Division of Water Pollution Control

Part I. COVERAGE UNDER THIS PERMIT

A. **Permit Area.** The permit covers all areas of the State of Illinois with discharges to any waters of the State.

B. ***Eligibility.***

1. This permit shall authorize all discharges of storm water associated with industrial activity from construction sites that will result in the disturbance of one or more acres total land area, construction sites less than one acre of total land that is part of a larger common plan of development or sale if the larger common plan will ultimately disturb one or more acres total land area or construction sites that are designated by the Agency that have the potential for contribution to a violation of water quality standard or significant contribution of pollutants to waters of the State, occurring after the effective date of this permit (including discharges occurring after the effective date of this permit where the construction activity was initiated before the effective date of this permit), except for discharges identified under paragraph I.B.3 (Limitations on Coverage).

2. This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

   a. the industrial source other than construction is located on the same site as the construction activity;

   b. storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

   c. storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants and dedicated concrete plants) are covered by a different NPDES general permit or individual permit authorizing such discharges.

3. Limitations on Coverage. The following storm water discharges from construction sites are not authorized by this permit:

   a. storm water discharges associated with industrial activity that originate from the site after construction activities have been completed and the site has undergone final stabilization;

   b. discharges that are mixed with sources of non-storm water other than discharges identified in Part III.A (Prohibition on Non-Storm Water Discharges) of this permit and in compliance with paragraph IV.D.5 (Non-Storm Water Discharges) of this permit;

   c. storm water discharges associated with industrial activity that are subject to an existing NPDES individual or general permit or which are issued a permit in accordance with Part VI.N (Requiring an Individual Permit or an Alternative General Permit) of this permit. Such discharges may be authorized under this permit after an existing permit expires provided the existing permit did not establish numeric limitations for such discharges;

d. storm water discharges from construction sites that the Agency has determined to be or may reasonably be expected to be contributing to a violation of a water quality standard; and

e. Storm water discharges that the Agency, at its discretion, determines are not appropriately authorized or controlled by this general permit.

f. Storm water discharges to any receiving water identified under 35 Ill. Adm. Code 302.105(d)(6).

C. Authorization.

1. In order for storm water discharges from construction sites to be authorized to discharge under this general permit a discharger must submit a Notice of Intent (NOI) in accordance with the requirements of Part II below, using an NOI form provided by the Agency, or be covered by a valid Illinois General NPDES Construction Site Activities Permit.

2. Where a new operator (contractor) is selected after the submittal of an NOI under Part II below, a new Notice of Intent (NOI) must be submitted by the owner in accordance with Part II.

3. For projects that have complied with State law on historic preservation and endangered species prior to submittal of the NOI, through coordination with the Illinois Historic Preservation Agency and the Illinois Department of Natural Resources or through fulfillment of the terms of interagency agreements with those agencies, the NOI shall indicate that such compliance has occurred.

Unless notified by the Agency to the contrary, dischargers who submit an NOI in accordance with the requirements of this permit are authorized to discharge storm water from construction sites under the terms and conditions of this permit in 30 days after the date the NOI is post marked.

The Agency may deny coverage under this permit and require submittal of an application for an individual NPDES permit based on a review of the NOI or other information.

Part II. NOTICE OF INTENT REQUIREMENTS

A. Deadlines for Notification.

1. To receive authorization under this general permit, a discharge must either be covered by a valid Illinois General NPDES Construction Site Permit, or a completed Notice of Intent (NOI) in accordance with Part VI.G (Signatory Requirements) and the requirements of this part must be submitted prior to the commencement of construction. The NOI must be submitted at least 30 days prior to the commencement of construction.

2. Discharges that are covered by a valid Illinois General NPDES Construction Site Activities Permit as of May 31, 2003 are automatically covered by this permit.

3. A discharger may submit an NOI in accordance with the requirements of this part after the start of construction. In such instances, the Agency may bring an enforcement action for any discharges of storm water associated with industrial activity from a construction site that have occurred on or after the start of construction.

B. Failure to Notify. Dischargers who fail to notify the Agency of their intent to be covered, and discharge storm water associated with construction site activity to Waters of the State without an NPDES permit, are in violation of the Environmental Protection Act and Clean Water Act.

C. Contents of Notice of Intent. The Notice of Intent shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit by all of the entities identified in paragraph 2 below and shall include the following information:

1. The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;

2. The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;

3. The name, address and telephone number of the general contractor(s) that have been identified at the time of the NOI submittal;

4. The name of the receiving water(s), or if the discharge is through a municipal separate storm sewer, the name of the municipal operator of the storm sewer and the ultimate receiving water(s);

5. The number of any NPDES permit for any discharge (including non-storm water discharges) from the site that is currently authorized by an NPDES permit;

6. A yes or no indication of whether the owner or operator has existing quantitative data which describes the concentration of pollutants in storm water discharges (existing data should not be included as part of the NOI); and

7. A brief description of the project, estimated timetable for major activities, estimates of the number of acres of the site on which soil will be disturbed, and a certification that a storm water pollution prevention plan has been or will be prepared for the facility in accordance with Part IV of this permit prior to the start of construction, and such plan provides compliance with local sediment and erosion plans or permits and/or storm water management plans or permits in accordance with paragraph VI.G.1 (Signatory Requirements) of this permit. (A copy of the plans or permits should not be included with the NOI submission).

D. Where to Submit.

1. Facilities which discharge storm water associated with construction site activity must use an NOI form provided by the Agency. NOIs must be signed in accordance with Part VI.G (Signatory Requirements) of this permit. NOIs are to be submitted certified mail to the Agency at the following address:

Illinois Environmental Protection Agency
Division of Water Pollution Control
Attention: Permit Section
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

2. A copy of the letter of notification of coverage or other indication that storm water discharges from the site are covered under an NPDES permit shall be posted at the site in a prominent place for public viewing (such as alongside a building permit).

E. Additional Notification. Facilities which are operating under approved local sediment and erosion plans, grading plans, or storm water management plans, in addition to filing copies of the Notice of Intent in accordance with Part D above, shall also submit signed copies of the Notice of Intent to the local agency approving such plans in accordance with the deadlines in Part A above. See Part IV.D.2.d (Approved State or Local Plans).

F. Notice of Termination. Where a site has been finally stabilized and all storm water discharges from construction sites that are authorized by this permit are eliminated, the permittee of the facility must submit a completed Notice of Termination that is signed in accordance with Part VI.G (Signatory Requirements) of this permit.

1. The Notice of Termination shall include the following information:

   a. The mailing address, and location of the construction site for which the notification is submitted. Where a mailing address for the site is not available, the location can be described in terms of the latitude and longitude of the approximate center of the facility to the nearest 15 seconds, or the nearest quarter section (if the section, township and range is provided) that the construction site is located in;

   b. The owner's name, address, telephone number, and status as Federal, State, private, public or other entity;

   c. The name, address and telephone number of the general contractor(s); and

   d. The following certification signed in accordance with Part VI.G (Signatory Requirements) of this permit:

   "I certify under penalty of law that all storm water discharges associated with construction site activity from the identified facility that are authorized by NPDES general permit ILR10 have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with construction site activity by the general permit, and that discharging pollutants in storm water associated with construction site activity to Waters of the State is unlawful under the Environmental Protection Act and Clean Water Act where the discharge is not authorized by a NPDES permit. I also understand that the submittal of this notice of termination does not release an operator from liability for any violations of this permit or the Clean Water Act."

   For the purposes of this certification, elimination of storm water discharges associated with industrial activity means that all disturbed soils at the identified facility have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or that all storm water discharges associated with construction activities from the identified site that are authorized by a NPDES general permit have otherwise been eliminated.

2. All Notices of Termination are to be sent, using the form provided by the Agency, to the address in paragraph II.D.1.

Part III. SPECIAL CONDITIONS, MANAGEMENT PRACTICES, AND OTHER NON-NUMERIC LIMITATIONS

A. Prohibition on Non-Storm Water Discharges.

1. Except as provided in paragraph I.B.2 and 2 below, all discharges covered by this permit shall be composed entirely of storm water.

2. a. Except as provided in paragraph b below, discharges of materials other than storm water must be in compliance with a NPDES permit (other than this permit) issued for the discharge.

   b. The following non-storm water discharges may be authorized by this permit provided the non-storm water component of the discharges is in compliance with paragraph IV.D.5 (Non-Storm Water Discharges): discharges from fire fighting activities; fire hydrant flushings; waters used to wash vehicles where detergents are not used; waters used to control dust; potable water sources including uncontaminated waterline flushings; irrigation drainages; routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; uncontaminated ground water; and foundation or footing drains where flows are not contaminated with process materials such as solvents.

B. Discharges into Receiving Waters With an Approved Total Maximum Daily Load (TMDL):

Discharges to waters for which there is a TMDL allocation for sediment or a parameter that addressed sediment (such as total suspended solids, turbidity, or siltation) are not eligible for coverage under this permit unless you develop and certify a SWPPP that is consistent with the assumptions and requirements in the approved TMDL. To be eligible for coverage under this general permit, operators must incorporate into their SWPPP any conditions applicable to their discharges necessary for consistency with the assumptions and requirements of the TMDL within any timeframes established in the TMDL. If a specific numeric wasteload allocation has been established that would apply to the project's discharges, the operator must incorporate that allocation into its SWPPP and implement necessary steps to meet that allocation.

C. Discharges covered by this permit, alone or in combination with other sources, shall not cause or contribute to a violation of any applicable water quality standard.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan shall be developed for each construction site covered by this permit. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction site activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which will be used to reduce the pollutants in storm water discharges associated with construction site activity and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. **Deadlines for Plan Preparation and Compliance.**

The plan shall:

1. Be completed prior to the start of the construction to be covered under this permit and updated as appropriate; and
2. Provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities.

B. **Signature, Plan Review and Notification.**

1. The plan shall be signed in accordance with Part VI.G (Signatory Requirements), and be retained on-site at the facility which generates the storm water discharge in accordance with Part VI.E (Duty to Provide Information) of this permit.
2. Prior to commencement of construction, the permittee shall provide written notification to the Agency of completion of the SWPPP and that said plan is available at the site.
3. The permittee shall make plans available upon request from this Agency or a local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system.
4. The Agency may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Such notification shall identify those provisions of the permit which are not being met by the plan, and identify which provisions of the plan requires modifications in order to meet the minimum requirements of this part. Within 7 days from receipt of notification from the Agency, the permittee shall make the required changes to the plan and shall submit to the Agency a written certification that the requested changes have been made. Failure to comply shall terminate authorization under this permit.
5. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public at any reasonable time upon request. However, the permittee may claim any portion of a storm water pollution prevention plan as confidential in accordance with 40 CFR Part 2.

C. Keeping Plans Current. The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the Waters of the State and which has not otherwise been addressed in the plan or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under paragraph D.2 below, or in otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with construction site activity. In addition, the plan shall be amended to identify any new contractor and/or subcontractor that will implement a measure of the storm water pollution prevention plan. Amendments to the plan may be reviewed by the Agency in the same manner as Part IV.B above.

D. Contents of Plan. The storm water pollution prevention plan shall include the following items:

1. Site Description. Each plan shall, provide a description of the following:
   a. A description of the nature of the construction activity;
   b. A description of the intended sequence of major activities which disturb soils for major portions of the site (e.g. grubbing, excavation, grading);
   c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities;
   d. An estimate of the runoff coefficient of the site after construction activities are completed and existing data describing the soil or the quality of any discharge from the site;
   e. A site map indicating drainage patterns and approximate slopes anticipated before and after major grading activities, locations where vehicles enter or exit the site and controls to prevent offsite sediment tracking, areas of soil disturbance, the location of major structural and nonstructural controls identified in the plan, the location of areas where stabilization practices are expected to occur, surface waters (including wetlands), and locations where storm water is discharged to a surface water; and
   f. The name of the receiving water(s) and the ultimate receiving water(s), and areal extent of wetland acreage at the site.
2. Controls. Each plan shall include a description of appropriate controls that will be implemented at the construction site. The plan will clearly describe for each major activity identified in paragraph D.1 above, appropriate controls and the timing during the construction process that the controls will be implemented. (For example, perimeter controls for one portion of the site will be installed after the clearing and grubbing necessary for installation of the measure, but before the clearing and grubbing for the remaining portions of the site. Perimeter controls will be actively maintained until final stabilization of those portions of the site upward of the perimeter control. Temporary perimeter controls will be removed after final stabilization). The description of controls shall address as appropriate the following minimum components:

a. **Erosion and Sediment Controls.**

(i) **Stabilization Practices.** A description of interim and permanent stabilization practices, including site-specific scheduling of the implementation of the practices. Site plans should ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include: temporary seeding, permanent seeding, mulching, geotextiles, sod stabilization, vegetative buffer strips, protection of trees, preservation of mature vegetation, and other appropriate measures. A record of the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated shall be included in the plan. Except as provided in paragraphs (A) and (B) below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased.

(A) Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable.

(B) Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of site by the 14th day after construction activity temporarily ceased.

(ii) **Structural Practices.** A description of structural practices to the degree attainable, to divert flows from exposed soils, store flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Such practices may include silt fences, earth dikes, drainage swales, sediment traps, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rock outlet protection, reinforced soil retaining systems, gabions, and temporary or permanent sediment basins. Structural practices should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA.

(iii) **Best Management Practices for Impaired Waters.** For any site which discharges directly to an impaired water identified in the Agency's 303(d) listing for suspended solids, turbidity, or siltation the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event. If required by federal regulations or the Illinois Environmental Protection Agency's Illinois Urban Manual, the storm water pollution prevention plan shall adhere to a more restrictive design criteria.

b. **Storm Water Management.** A description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed. Structural measures should be placed on upland soils to the degree attainable. The installation of these devices may be subject to Section 404 of the CWA. This permit only addresses the installation of storm water management measures, and not the ultimate operation and maintenance of such structures after the construction activities have been completed and the site has undergone final stabilization. Permittees are responsible for only the installation and maintenance of storm water management measures prior to final stabilization of the site, and are not responsible for maintenance after storm water discharges associated with industrial activity have been eliminated from the site.

(i) Such practices may include: storm water detention structures (including wet ponds); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The pollution prevention plan shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed predevelopment levels.

(ii) Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g. maintenance of hydrologic conditions, such as the hydroperiod and hydrodynamics present prior to the initiation of construction activities).

(iii) Unless otherwise specified in the Illinois Environmental Protection Agency's Illinois Urban Manual, the storm water pollution prevention plan shall be designed for a storm event equal to or greater than a 25-year 24-hour rainfall event.

c. **Other Controls.**

(i) **Waste Disposal.** No solid materials, including building materials, shall be discharged to Waters of the State, except as authorized by a Section 404 permit.

(ii) The plan shall ensure and demonstrate compliance with applicable State and/or local waste disposal, sanitary sewer or septic system regulations.

d. **Approved State or Local Plans.**

(i) The management practices, controls and other provisions contained in the storm water pollution prevention plan must be at least as protective as the requirements contained in Illinois Environmental Protection Agency's Illinois Urban Manual, 2002. Facilities which discharge storm water associated with construction site activities must include in their storm water pollution prevention plan procedures and requirements specified in applicable sediment and erosion site plans or storm water management plans approved by local officials. Requirements specified in sediment and erosion site plans or site permits or storm water management site plans or site permits approved by local officials that are applicable to protecting surface water resources are, upon submittal of an NOI to be authorized to discharge under this permit, incorporated by reference and are enforceable under this permit even if they are not specifically included in a storm water pollution prevention plan required under this permit. This provision does not apply to provisions of master plans, comprehensive plans, non-enforceable guidelines or technical guidance documents that are not identified in a specific plan or permit that is issued for the construction site.

(ii) Dischargers seeking alternative permit requirements are not authorized by this permit and shall submit an individual permit application in accordance with 40 CFR 122.26 at the address indicated in Part II.D (Where to Submit) of this permit, along with a description of why requirements in approved local plans or permits should not be applicable as a condition of an NPDES permit.

3. Maintenance. A description of procedures to maintain in good and effective operating conditions vegetation, erosion and sediment control measures and other protective measures identified in the site plan.

4. Inspections. Qualified personnel (provided by the permittee) shall inspect disturbed areas of the construction site that have not been finally stabilized, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within 24 hours of the end of a storm that is 0.5 inches or greater or equivalent snowfall. Qualified personnel means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a licensed professional engineer or other knowledgeable person who possesses the skills to assess conditions at the construction site that could impact storm water quality and to assess the effectiveness of any sediment and erosion control measures selected to control the quality of storm water discharges from the construction activities.

   a. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of, or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the plan shall be observed to ensure that they are operating correctly. Where discharge locations or points are accessible, they shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of offsite sediment tracking.

   b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan in accordance with paragraph IV.D.1 (Site Description) of this permit and pollution prevention measures identified in the plan in accordance with paragraph IV.D.2 (Controls) of this permit shall be revised as appropriate as soon as practicable after such inspection. Such modifications shall provide for timely implementation of any changes to the plan within 7 calendar days following the inspection.

   c. A report summarizing the scope of the inspection, name(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph b above shall be made and retained as part of the storm water pollution prevention plan for at least three years from the date that the permit coverage expires or is terminated. The report shall be signed in accordance with Part VI.G (Signatory Requirements) of this permit.

   d. The permittee shall complete and submit within 5 days an "Incidence of Noncompliance" (ION) report for any violation of the storm water pollution prevention plan observed during an inspection conducted, including those not required by the Plan. Submission shall be on forms provided by the Agency and include specific information on the cause of noncompliance, actions which were taken to prevent any further causes of noncompliance, and a statement detailing any environmental impact which may have resulted from the noncompliance.

   e. All reports of noncompliance shall be signed by a responsible authority as defined in Part VI.G (Signatory Requirements).

   f. All reports of noncompliance shall be mailed to the Agency at the following address:

      Illinois Environmental Protection Agency
      Division of Water Pollution Control
      Compliance Assurance Section
      1021 North Grand Avenue East
      Post Office Box 19276
      Springfield, Illinois 62794-9276

5. Non-Storm Water Discharges - Except for flows from fire fighting activities, sources of non-storm water listed in paragraph III.A.2 of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and insure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

E. Additional requirements for storm water discharge from industrial activities other than construction, including dedicated asphalt plants, and dedicated concrete plants. - This permit may only authorize a storm water discharge associated with industrial activity from a construction site that is mixed with a storm water discharge from an industrial source other than construction, where:

1. The industrial source other than construction is located on the same site as the construction activity;

2. Storm water discharges associated with industrial activity from the areas of the site where construction activities are occurring are in compliance with the terms of this permit; and

3. Storm water discharges associated with industrial activity from the areas of the site where industrial activity other than construction are occurring (including storm water discharges from dedicated asphalt plants (other than asphalt emulsion facilities) and dedicated concrete plants) are in compliance with the terms, including applicable NOI or application requirements, of a different NPDES general permit or individual permit authorizing such discharges.

F. Contractors.

1. The storm water pollution prevention plan must clearly identify for each measure identified in the plan, the contractor(s) or subcontractor(s) that will implement the measure. All contractors and subcontractors identified in the plan must sign a copy of the certification statement in paragraph 2 below in accordance with Part VI.G (Signatory Requirements) of this permit. All certifications must be included in the storm water pollution prevention plan except for owners that are acting as contractor.

3 Certification Statement. All contractors and subcontractors identified in a storm water pollution prevention plan in accordance with paragraph 1 above shall sign a copy of the following certification statement before conducting any professional service at the site identified in the storm water pollution prevention plan:

> "I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the storm water discharges associated with industrial activity from the construction site identified as part of this certification."

The certification must include the name and title of the person providing the signature in accordance with Part VI.G of this permit; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification is made.

Part V. RETENTION OF RECORDS

A. The permittee shall retain copies of storm water pollution prevention plans and all reports and notices required by this permit, and records of all data used to complete the Notice of Intent to be covered by this permit, for a period of at least three years from the date that the permit coverage expires or is terminated. This period may be extended by request of the Agency at any time.

B. The permittee shall retain a copy of the storm water pollution prevention plan required by this permit at the construction site from the date of project initiation to the date of final stabilization.

Part VI. STANDARD PERMIT CONDITIONS

A. Duty to Comply.

The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of Illinois Environmental Protection Act and the CWA and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

B. Continuation of the Expired General Permit. This permit expires five years from the date of issuance. An expired general permit continues in force and effect until a new general permit or an individual permit is issued. Only those facilities authorized to discharge under the expiring general permit are covered by the continued permit.

C. Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Duty to Provide Information. The permittee shall furnish within a reasonable time to the Agency or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, any information which is requested to determine compliance with this permit. Upon request, the permittee shall also furnish to the Agency or local agency approving sediment and erosion plans, grading plans, or storm water management plans; or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the municipal operator of the system, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the Notice of Intent or in any other report to the Agency, he or she shall promptly submit such facts or information.

G. Signatory Requirements. All Notices of Intent, storm water pollution prevention plans, reports, certifications or information either submitted to the Agency or the operator of a large or medium municipal separate storm sewer system, or that this permit requires be maintained by the permittee, shall be signed.

1. All Notices of Intent shall be signed as follows:

   a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (1) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or (2) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25,000,000 (in second-quarter 1980 dollars) if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

   c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency, or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

2. All reports required by the permit and other information requested by the Agency shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described above and submitted to the Agency.

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator, superintendent, or position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position).

   c. Changes to authorization. If an authorization under paragraph I.C (Authorization) is no longer accurate because a different individual or position has responsibility for the overall operation of the construction site, a new authorization satisfying the requirements of paragraph I.C must be submitted to the Agency prior to or together with any reports, information, or applications to be signed by an authorized representative

   d. Certification. Any person signing documents under this Part shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. **Penalties for Falsification of Reports.** Section 309(c)(4) of the Clean Water Act provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $10,000, or by imprisonment for not more than 2 years, or by both. Section 44(j)(4) and (5) of the Environmental Protection Act provides that any person who knowingly makes any false statement, representation, or certification in an application form, or form pertaining to a NPDES permit commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed $10,000 for each day of violation.

I. **Penalties for Falsification of Monitoring Systems.** The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by fines and imprisonment described in Section 309 of the CWA. The Environmental Protection Act provides that any person who knowingly renders inaccurate any monitoring device or record required in connection with any NPDES permit or with any discharge which is subject to the provisions of subsection (f) of Section 12 of the Act commits a Class A misdemeanor, and in addition to any other penalties provided by law is subject to a fine not to exceed $10,000 for each day of violation.

J. **Oil and Hazardous Substance Liability.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under section 311 of the CWA.

K. **Property Rights.** The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

L. **Severability.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

M. **Transfers.** This permit is not transferable to any person except after notice to the Agency. The Agency may require the discharger to apply for and obtain an individual NPDES permit as stated in Part I.C (Authorization).

N. **Requiring an Individual Permit or an Alternative General Permit.**

1. The Agency may require any person authorized by this permit to apply for and/or obtain either an individual NPDES permit or an alternative NPDES general permit. Any interested person may petition the Agency to take action under this paragraph. Where the Agency requires a discharger authorized to discharge under this permit to apply for an individual NPDES permit, the Agency shall notify the discharger in writing that a permit application is required. This notification shall include a brief statement of the reasons for this decision, an application form, a statement setting a deadline for the discharger to file the application, and a statement that on the effective date of the individual NPDES permit or the alternative general permit as it applies to the individual permittee, coverage under this general permit shall automatically terminate. Applications shall be submitted to the Agency indicated in Part II.D (Where to Submit) of this permit. The Agency may grant additional time to submit the application upon request of the applicant. If a discharger fails to submit in a timely manner an individual NPDES permit application as required by the Agency under this paragraph, then the applicability of this permit to the individual NPDES permittee is automatically terminated at the end of the day specified by the Agency for application submittal. The Agency may require an individual NPDES permit based on:

   a. information received which indicates the receiving water may be of particular biological significance pursuant to 35 Ill. Adm. Code 302.105(d)(6);

   b. whether the receiving waters are impaired waters for suspended solids, turbidity or siltation as identified by the Agency's 303(d) listing;

   c. size of construction site, proximity of site to the receiving stream, etc.

   The Agency may also require monitoring of any storm water discharge from any site to determine whether an individual permit is required.

2. Any discharger authorized by this permit may request to be excluded from the coverage of this permit by applying for an individual permit. In such cases, the permittee shall submit an individual application in accordance with the requirements of 40 CFR 122.26(c)(1)(ii), with reasons supporting the request, to the Agency at the address indicated in Part II.D (Where to Submit) of this permit. The request may be granted by issuance of any individual permit or an alternative general permit if the reasons cited by the permittee are adequate to support the request.

3. When an individual NPDES permit is issued to a discharger otherwise subject to this permit, or the discharger is authorized to discharge under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of authorization of coverage under the alternative general permit, whichever the case may be. When an individual NPDES permit is denied to a discharger otherwise subject to this permit, or the discharger is denied for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee remains in effect, unless otherwise specified by the Agency.

O. **State/Environmental Laws.** No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

P. **Proper Operation and Maintenance.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of storm water pollution prevention plans. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

Q. **Inspection and Entry.** The permittee shall allow the IEPA, or an authorized representative upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

R. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

Part VII. REOPENER CLAUSE

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with industrial activity covered by this permit, the discharger may be required to obtain an individual permit or an alternative general permit in accordance with Part I.C (Authorization) of this permit or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to provisions of 35 Ill. Adm. Code, Subtitle C, Chapter I and the provisions of 40 CFR 122.62, 122.63, 122.64 and 124.5 and any other applicable public participation procedures.

C. The Agency will reopen and modify this permit under the following circumstances:

1. the U.S. EPA amends its regulations concerning public participation;

2. a court of competent jurisdiction binding in the State of Illinois or the 7th Circuit issues an order necessitating a modification of public participation for general permits; or

3. to incorporate federally required modifications to the substantive requirements of this permit.

Part VIII. DEFINITIONS

"Agency" means the Illinois Environmental Protection Agency.

"Best Management Practices" ("BMPs") means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Commencement of Construction" - The initial disturbance of soils associated with clearing, grading, or excavating activities or other construction activities.

"CWA" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub.L. 92-500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. (96-483 and Pub. L. 97-117, 33 U.S.C. 1251 et.seq.)

"Dedicated portable asphalt plant" - A portable asphalt plant that is located on or contiguous to a construction site and that provides asphalt only to the construction site that the plant is located on or adjacent to. The term dedicated portable asphalt plant does not include facilities that are subject to the asphalt emulsion effluent limitation guideline at 40 CFR 443.

"Dedicated portable concrete plant" - A portable concrete plant that is located on or contiguous to a construction site and that provides concrete only to the construction site that the plant is located on or adjacent to.

"Dedicated sand or gravel operation" - An operation that produces sand and/or gravel for a single construction project.
"Director" means the Director of the Illinois Environmental Protection Agency or an authorized representative.

"Final Stabilization" means that all soil disturbing activities at the site have been completed, and that a uniform perennial vegetative cover with a density of 70% the cover for unpaved areas and areas not covered by permanent structures has been established or equivalent stabilization measures (such as the use of riprap, gabions or geotextiles) have been employed.

"Large and Medium municipal separate storm sewer system" means all municipal separate storm sewers that are either:

(i) Located in an incorporated place (city) with a population of 100,000 or more as determined by the latest Decennial Census by the Bureau of Census (these cities are listed in Appendices F and G of 40 CFR Part 122); or

(ii) Located in the counties with unincorporated urbanized populations of 100,000 or more, except municipal separate storm sewers that are located in the incorporated places, townships or towns within such counties (these counties are listed in Appendices H and I of 40 CFR Part 122); or

(iii) Owned or operated by a municipality other than those described in paragraph (i) or (ii) and that are designated by the Director as part of the large or medium municipal separate storm sewer system.

"NOI" means notice of intent to be covered by this permit (see Part II of this permit.)

"Point Source" means any discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharges. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

"Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the

term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)- (xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28, 29, 311, 32, 33, 3441, 373;

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42, 44, and 45 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under subparagraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity including clearing, grading and excavation activities except: operations that result in the disturbance of less than one acre of total land area which are not part of a larger common plan of development or sale unless otherwise designated by the Agency pursuant to Part I.B.1.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (i)-(x)).

"Waters" mean all accumulations of water, surface and underground, natural, and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon the State of Illinois, except that sewers and treatment works are not included except as specially mentioned; provided, that nothing herein contained shall authorize the use of natural or otherwise protected waters as sewers or treatment works except that in-stream aeration under Agency permit is allowable.

Dear Permit Holder:

For your convenience please find the following enclosed forms to use in the future:

- A NEW NOTICE OF INTENT (NOI) for General Permits to Discharge Storm Water Construction Site Activities.
- A NOTICE OF TERMINATION (NOT) for Storm Water Discharges Associated with Construction Site Activity.

The new NOI for Construction Site Activities is included for your convenience to use in the future.

The NOT for Storm Water Discharge Associated with Construction Site Activity should be filled out and sent to IEPA when a site has been finally stabilized and cleaned up. A site can be considered finally stabilized when all soil disturbing activities at the site have been completed and a uniform perennial vegetative cover with a density of 70 percent for the unpaved areas and areas not covered by permanent structures has been established or equivalent permanent stabilization measures have been employed. Cleanup involves removing temporary sediment and erosion controls and disposing of construction wastes.

For more information regarding the NOT, see the Construction Site Activities National Pollutant Discharge Elimination System (NPDES) Storm Water Permit: Part II, Notice of Intent Requirements, F – Notice of Termination.

For additional forms, please see Illinois EPA's website at: http://www.epa.state.il.us/water/permits/storm-water/index.html

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF INTENT (NOI)

GENERAL PERMIT TO DISCHARGE STORM WATER CONSTRUCTION SITE ACTIVITIES

OWNER INFORMATION

NAME:	LAST FIRST MIDDLE INITIAL (OR COMPANY NAME)			OWNER TYPE: (SELECT ONE) ☐ PRIVATE ☐ COUNTY ☐ CITY ☐ SPECIAL DISTRICT ☐ FEDERAL ☐ STATE		
MAILING ADDRESS:						
CITY:		STATE:		ZIP:		
CONTACT PERSON:		TELEPHONE NUMBER:	AREA CODE	NUMBER		

CONTRACTOR INFORMATION

NAME:		TELEPHONE NUMBER:	AREA CODE	NUMBER			
MAILING ADDRESS:		CITY:		STATE:		ZIP:	

CONSTRUCTION SITE INFORMATION

SELECT ONE:	☐ NEW SITE ☐ CHANGE OF INFORMATION FOR GENERAL NPDES STORM WATER PERMIT NUMBER: ILR10 ____ ____ ____												
FACILITY NAME:					OTHER NPDES PERMIT NUMBERS:								
FACILITY LOCATION:	(Not necessarily the mailing address)				TELEPHONE NUMBER:	AREA CODE	NUMBER						
CITY:		ST: IL	ZIP:		LATITUDE:	DEG.	MIN.	SEC.	LONGITUDE:	DEG.	MIN.	SEC.	
COUNTY:		SECTION:			TOWNSHIP:				RANGE:				
APPROX CONST START DATE:		APPROX CONST END DATE:			TOTAL SIZE OF CONSTRUCTION SITE IN ACRES:								
STORM WATER POLLUTION PREVENTION PLAN COMPLETED ☐ YES ☐ NO (IF NO, SEPARATE NOTIFICATION REQUIRED TO AGENCY PRIOR TO CONSTRUCTION.)													

TYPE OF CONSTRUCTION (SELECT ALL THAT APPLY)

☐ RESIDENTIAL	☐ COMMERCIAL	☐ INDUSTRIAL	☐ RECONSTRUCTION	☐ TRANSPORTATION	☐ OTHER
TYPE BRIEF DESCRIPTION OF PROJECT:					

HISTORIC PRESERVATION AND ENDANGERED SPECIES COMPLIANCE

HAS THIS PROJECT SATISFIED APPLICABLE REQUIREMENTS FOR COMPLIANCE WITH ILLINOIS LAW ON:

HISTORIC PRESERVATION ☐ YES ☐ NO

ENDANGERED SPECIES ☐ YES ☐ NO

RECEIVING WATER INFORMATION

DOES YOUR STORM WATER DISCHARGE DIRECTLY TO: ☐ WATERS OF THE STATE OR ☐ STORM SEWER		OWNER OF STORM SEWER SYSTEMS:	
NAME OF CLOSEST RECEIVING WATER:			

I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage this system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. In addition, I certify that the provisions of the permit, including the development and implementation of a storm water pollution prevention plan and a monitoring program plan, will be complied with.

OWNER SIGNATURE: _____ DATE: _____

MAIL COMPLETED FORM TO:

(DO NOT SUBMIT ADDITIONAL DOCUMENTATION UNLESS REQUESTED)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
ATTN: PERMIT SECTION
POST OFFICE BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276
www.epa.state.il.us

FOR OFFICE USE ONLY

LOG:
PERMIT NO. ILR10 ____ ____ ____ ____
DATE:

Information required by this form must be provided to comply with 415 ILCS 5/39 (1996). Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IL 532 2104
WPC 623 Rev. 6/03

INSTRUCTIONS FOR COMPLETION OF CONSTRUCTION ACTIVITY NOTICE OF INTENT (NOI) FORM

Please adhere to the following instructions:

Submit original, photocopy or facsimile copies. Facsimile and/or photo copies should be followed-up with an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the lower right hand corner.

- Submit completed forms to:

  Illinois Environmental Protection Agency
  Division of Water Pollution Control
  Permit Section
  Post Office Box 19276
  Springfield, Illinois 62794-9276
  or call (217)782-0610
  www.epa.state.il.us

- Reports must be typed or printed legibly and signed.

- Any facility that is not presently covered by the ILR10 Construction Activity Storm Water Discharge General Permit is considered a new facility.

- If this is a change in your facility information, renewal, etc., please fill in your permit number on the appropriate line.

- NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

- Use the formats given in the following examples for correct form completion.

	Example	Format
SECTION	12	1 or 2 numerical digits
TOWNSHIP	12N	1 or 2 numerical digits followed by "N" or "S"
RANGE	12W	1 or 2 numerical digits followed by "E" or "W"

- For the Name of Closest Receiving Waters, do not use terms such as ditch or channel. For unnamed tributaries, use terms which include at least a named main tributary such as "Unnamed Tributary to Sugar Creek to Sangamon River."

- Submit a fee of $500 prior to the Notice of Intent being considered complete for coverage by the ILR10 General Permits. Please make checks payable to: Illinois EPA.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

NOTICE OF TERMINATION (NOT)

OF COVERAGE UNDER THE GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION SITE ACTIVITY

OWNER INFORMATION

NAME:	LAST	FIRST	MIDDLE INITIAL		OWNER TYPE: (SELECT ONE) ☐ PRIVATE ☐ COUNTY ☐ CITY ☐ SPECIAL DISTRICT ☐ FEDERAL ☐ STATE	
MAILING ADDRESS:						
CITY:		STATE:		ZIP:		
CONTACT PERSON:		TELEPHONE NUMBER:	AREA CODE	NUMBER		

CONTRACTOR INFORMATION

NAME:			TELEPHONE NUMBER:	AREA CODE	NUMBER		
MAILING ADDRESS:		CITY:		STATE:		ZIP:	

CONSTRUCTION SITE INFORMATION

FACILITY NAME:							NPDES STORM WATER GENERAL PERMIT NUMBER:	I	L	R	1	0				
FACILITY LOCATION:	(Not necessarily the mailing address)															
CITY:		STATE:	IL	ZIP:		LATITUDE	DEG.	MIN.	SEC.	LONGITUDE:			DEG.	MIN.	SEC.	
COUNTY:			SECTION:			TOWNSHIP:				RANGE:						

DATE PROJECT HAS BEEN COMPLETED AND STABILIZED:

I certify under penalty of law that disturbed soils at the identified facility have been finally stabilized or that all storm water discharges associated with industrial activity from the identified facility that are authorized by an NPDES general permit have otherwise been eliminated. I understand that by submitting this notice of termination, that I am no longer authorized to discharge storm water associated with industrial activity by the general permit, and that discharging pollutants in storm water associated with industrial activity to Waters of the State is unlawful under the Environmental Protection Act and the Clean Water Act where the discharge is not authorized by an NPDES permit.

OWNER SIGNATURE:_____ DATE: _____

MAIL COMPLETED FORM TO:

(DO NOT SUBMIT ADDITIONAL DOCUMENTATION UNLESS REQUESTED)

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF WATER POLLUTION CONTROL
ATTN: PERMIT SECTION
POST OFFICE BOX 19276
SPRINGFIELD, ILLINOIS 62794-9276

FOR OFFICE USE ONLY

LOG:
PERMIT NO. ILR10 ___ ___ ___ ___
DATE:

Information required by this form must be provided to comply with 415 ILCS 5/39 (1996). Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

IL 532 2102
WPC 621 Rev. 1/04

GUIDELINES FOR COMPLETION OF NOTICE OF TERMINATION (NOT) FORM

Please adhere to the following guidelines:

Submit original, photocopy or facsimile copies. Facsimile and/or photo copies should be followed-up with an original signature copy as soon as possible. Please write "copy" under the "For Office Use Only" box in the lower right hand corner.

- Submit completed forms to:

  Illinois Environmental Protection Agency
  Division of Water Pollution Control
  Permit Section
  Post Office Box 19276
  Springfield, Illinois 62794-9276
  217/782-0610

- Reports must be typed or printed legibly and signed.

- NOTE: FACILITY LOCATION IS NOT NECESSARILY THE FACILITY MAILING ADDRESS, BUT SHOULD DESCRIBE WHERE THE FACILITY IS LOCATED.

- Use the formats given in the following examples for correct form completion.

	Example	Format
SECTION	12	1 or 2 numerical digits
TOWNSHIP	12N	1 or 2 numerical digits followed by "N" or "S"
RANGE	12W	1 or 2 numerical digits followed by "E" or "W"

- Final stabilization has occurred when:

  (a) all soil disturbing activities at the site have been completed
  (b) a uniform perennial vegetative cover with a density of 70% of the native background vegetative cover for the area has been established on all unpaved areas and areas not covered by permanent structures,
  (c) or equivalent permanent stabilization measures have been employed.

ATTACHMENT A-2

SWPPP INSPECTION FORMS

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

SILT FENCE

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____ Amount of Last Rainfall: _____inches

Where is the Silt Fence Located?	Is the Bottom of the Fabric Still Buried?	Is the Fabric Torn or Sagging?	Are the Posts Tipping Over?	How Deep is the Sediment?

MAINTENANCE REQUIRED FOR SILT FENCE: _____

_____

_____

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

_____

ENTACT

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

HAY BALES

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____ Amount of Last Rainfall: _____inches

Where are the `Hay Bales Located?	Are the Hay Bales Embedded in the Ground?	Are the Hay Bales Anchored in Place?	What is the Condition of the Hay Bales?

MAINTENANCE REQUIRED FOR HAY BALES: _____

_____

_____

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

_____

ENTACT

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

EARTHEN BERMS

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____ Amount of Last Rainfall: _____inches

Where is the Earthen Berm Located?	Is the Earthen Berm Still Inplace?	Is there Evidence of Washout or Over-Topping?	What is the Condition of the Earthen Berm?

MAINTENANCE REQUIRED FOR EARTHEN BERMS: _____

_____

_____

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

_____

ENTACT

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

INLET PROTECTION BARRIERS

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____ Amount of Last Rainfall: ___inches

Location	In Place?	Depth of Sediment	Condition of Inlet

MAINTENANCE REQUIRED FOR INLET PROTECTION BARRIERS: _____

_____

_____

_____

_____

_____

_____

_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

_____

ENTACT

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

STABILIZED CONSTRUCTION ENTRANCE

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____ Amount of Last Rainfall: ___inches

Location	Is Sediment Being Tracked onto Road?	Is the Entry Surface Clean or Sediment Filled?	Does All Traffic Use the Entrance?

MAINTENANCE REQUIRED FOR STABILIZED CONSTRUCTION ENTRANCES: ___

_____
_____
_____
_____
_____
_____
_____
_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

_____

ENTACT

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

(Completed weekly or as soon as possible after a significant storm event)

Name of Inspector: _____ Inspection Date: _____
Days Since Last Rainfall: _____
Amount of Last Rainfall: _____

STABILIZATION MEASURES					
Area or Drainage Areas*	**Date Since Last Disturbance**	**Date of Next Disturbance**	**Stabilized (Yes or No)**	**Control Measures Implemented**	**Current Conditions of Control Measures**

* See site map for drainage areas. Site may include borrow sources, haul roads, contractor's yard, stockpiles, etc.
** Areas that will be exposed more than 21 days must be stabilized within 14 days

STABILIZATION REQUIRED: _____

_____

_____

_____

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

Control Measure Codes		**Condition Codes**
1. Temporary Seeding	14. Rock Bed at Construction Exit	U – Upgrade Needed
2. Permanent Plant, Sod, or Seed	15. Timber Mat at Construction Entrance	R – Replacement Needed
3. Mulch	16. Channel Liner	M – Maintenance Needed
4. Soil Retention Blanket	17. Sediment Trap	C – Cleaning Needed
5. Buffer Zone	18. Sediment Basin	I – Increase Measures
6. Preserve Natural Resources	19. Storm Inlet Sediment Trap	S – Stable (no action required)
7. Silt Fence	20. Stone Outlet Structure	
8. Hay Bales	21. Curb and Gutter	
9. Rock Berm	22. Storm Sewers	
10. Diversion Dike	23. Velocity Control Devices	
11. Diversion Swale	24. Excess Dirt Removed From Road	
12. Pipe Slope Drain	25. Haul Roads Dampened for Dust	
13. Paved Flume	26. Cleanup of Possible Contaminants	

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry or the person who manage the system or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: _____

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

CHANGES REQUIRED TO THE STORMWATER POLLUTION PREVENTION PLAN:

REASONS FOR CHANGE:

TO BE PERFORMED BY: _____ **ON OR BEFORE:** _____

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

BEST MANAGEMENT PRACTICE
INSPECTION AND MAINTENANCE REPORT FORM

CONSTRUCTION ACTIVITIES LOG

Name of Inspector	Date	Major Grading Activities	Temporary Suspension of Construction Activities	Permanent Suspension of Construction Activities	Initiation of Stabilization Measures	Comments

Date	Additional Changes

ATTACHMENT A-3

CERTIFICATION FORM

CONTRACTOR CERTIFICATION OF SWPPP

I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit (ILR10) that authorizes the stormwater discharges associated with industrial activity from the construction site identified as part of this certification.

Keystone Steel & Wire Company Peoria, Illinois			
Printed Name	**Company Name, Address and Phone**	**Signature**	**Date**

APPENDIX B

FIELD SAMPLING PLAN

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

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1.0 INTRODUCTION

This Field Sampling Plan (FSP) has been prepared by ENTACT Services, LLC (ENTACT) on behalf of the Keystone Steel and Wire Company (Keystone) for its manufacturing facility located in Peoria, Illinois. This FSP was developed for use in conjunction with the *Corrective Measures Implementation (CMI) Workplan* and associated plans. These are distinct documents that form the project operations plans intended to guide field personnel, contractors and other involved parties in all aspects of field operations. This FSP will discuss the sampling criteria necessary to ensure data of sufficient quality are obtained to support corrective measures decisions.

1.1 Sampling Summary

This FSP for the F-Pond and North Ditch Staging Area will be implemented for the following types of samples:

- Characterization of surface water in the F-Pond, if present;
- Characterization of the in-place soil/sediment to determine if the material exhibits the toxicity characteristic for lead;
- Characterization of the in-place soil/sediment to determine the extent of total lead and iron contamination;
- Characterization of the in-place, in-situ treated soil/sediment to confirm that the material no longer exhibits the toxicity characteristic for lead and will not be considered a hazardous waste;
- Confirmation of in-place soils for excavation confirmation purposes;
- Characterization of backfill and topsoil materials for determining potential use; and
- Characterization of groundwater.

Action levels associated with these types of samples are as follows:

ACTION LEVELS				
Sample Type	**Constituents of Concern**	**F-Pond**	**North Ditch Staging Area**	**Backfill/ Topsoil**
XRF Field Screening	Lead	800 ppm	800 ppm	
	Iron	100,000 ppm		
Surface Water	Lead	Water will be transferred to the facility WWTP		

ACTION LEVELS				
Sample Type	**Constituents of Concern**	**F-Pond**	**North Ditch Staging Area**	**Backfill/ Topsoil**
	Iron	for discharge with facility wastewaters. The discharge will meet the limits specified in the facility's NPDES permit.		
	Manganese			
	Trichloroethylene			
Characterization	Lead	800 mg/kg		
	Iron	100,000 mg/kg		
	TCLP Lead	5 mg/l	5 mg/l	
Post-excavation Confirmation	Lead	800 mg/kg	800 mg/kg	
	Iron	100,000 mg/kg		
	TCLP Lead	5 mg/l	5 mg/l	
Backfill/Topsoil	Arsenic			13 mg/kg
	Barium			14,000 mg/kg
	Cadmium			200 mg/kg
	Chromium			420 mg/kg
	Lead			400 mg/kg
	Mercury			61 mg/kg
	Selenium			1,000 mg/kg
	Silver			1,000 mg/kg
	TPH			100 mg/kg
Groundwater	Lead	0.015 mg/l	0.015 mg/l	

The following sections describe the activities associated with the sampling to be performed during this project. The *Quality Assurance Project Plan* (*QAPP*), included as Appendix C to the *CMI Workplan*, further describes the quality assurance/quality control requirements associated with the sampling activities.

2.0 FIELD SAMPLING ACTIVITIES IMPLEMENTATION

2.1 Establishment of Grid System

A grid system will be established at each unit in order to provide a method for tracking sediment/soil sampling and excavation activities in the field. Each unit will be staked with grid points in order to establish the grids. Grids located in the F-Pond will have a uniform square footage of approximately 2,500 square feet, but may have differing lengths or widths in order to conform to the perimeter of the unit. Grids located in the North Ditch Staging Area will be established using a 50-foot by 50-foot grid length and width.

The approximate location of the grid system for each unit is presented on Figures 1 and 2. Actual marking of grid corners in the field will be made by wooden stakes, spray paint and/or survey flags. ENTACT will install flagging and wooden stakes along fences and other places to delineate those corners and benchmarks where corrective measures activities could disrupt grid markings. This grid system will be used to provide reference markers for 1) XRF field screening activities; 2) characterization sediment/soil sampling; and 3) post-excavation confirmatory sediment/soil sampling.

2.2 Sample Identification System and Sample Frequency

A sample identification system will be implemented in order to properly track sampling activities. The sampling activities, examples of the identification coding system associated with each type and sample frequency are listed below with an explanation following:

SAMPLE IDENTIFICATION SYSTEM		
Sample Type	**Sample ID**	**Sample Frequency**
X-Ray Fluorescence (XRF) Field Screening of Soils	X-Unit (F, ND)-Grid #-000-depth	As needed
F-Pond Characterization Samples	CS-F-Grid or Stockpile #-000-depth	1 composite sample per grid; 1 composite sample per 300 cy in-situ treated sediment/soil volume
F-Pond Post-Excavation Confirmation Samples	ECS-F-Grid #-000-depth	1 sample per grid bottom and sidewall
North Ditch Staging Area Characterization Samples	CS-ND-Location ID #-000-depth	1 grab sample per location; 1 composite sample per 300 cy in-situ treated soil volume
North Ditch Staging Area Post-Excavation Confirmation Samples	ECS-ND-Grid #-000-depth	1 sample per grid bottom and sidewall

SAMPLE IDENTIFICATION SYSTEM		
Sample Type	**Sample ID**	**Sample Frequency**
Backfill and Topsoil Materials	BF-000	1 sample per source
F-Pond Surface Water	SW-F-000	1 sample
Groundwater	Groundwater Monitoring Well No.	1 sample per monitoring well
Reverification of an excavated grid at a new depth	"R" added to the end of the sample ID, plus the new depth, i.e. ECS-F-Grid #-000R-depth	As needed
Field Duplicate Samples	"X" added to end of sample ID, i.e. ECS-SD-Grid #-001X-depth	1 duplicate per every 10 samples, matrix independent
Field Equipment Rinsate Blank	RB-000	1 per day of sampling with non-disposable equipment
Matrix Spike/Matrix Spike Duplicate	MS/MSD	1 MS/MSD per every 20 samples
Trip Blank	TB-000	1 per every cooler of samples for VOC analysis

All numbering sequences shown above with "000" will begin with the number "001" and will continue upward by one unit (i.e., RB-001, RB-002, RB-003, etc.) until the final samples for the corrective measures are collected. It should be noted that sampling nomenclature may be modified in the field if a more informative identification system becomes evident.

2.3 Laboratory Turnaround

All written laboratory turnaround times will be no more than 72 hours (three business days). Verbal turnaround times on soil samples should not be more than 48 hours (two business days). It is expected that samples collected on Fridays, Saturdays or before holidays may take one to two additional days.

3.0 SAMPLE COLLECTION PROCEDURES

Sampling procedures are described in the following sections based on sample type.

3.1 XRF Field Screening Samples

XRF field screening for total lead and iron in sediment/soil will be performed as follows:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan*. Only qualified analysts trained in the proper use, theory and safety of XRF analysis will operate this unit.

b. The XRF will be calibrated as described in the manufacturer's instructions and specifications prior to use.

c. The sample location on the ground surface will be identified using a site map with grid coordinates. The XRF sample location will be documented on a grid-specific XRF data sheet.

d. The XRF probe will be placed on the flat, compacted surface, activated and held in place for the 60-second scanning period. If necessary, the scanning time will be extended. The sample identification number and corresponding XRF reading will be entered into the unit's computer memory and recorded in the field logbook. If the moisture content of the soil is not optimal for in-situ XRF screening, then a grab sample will be collected from a depth of 0 to 1 inch below ground surface for drying prior to measurement using a microwave.

e. All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse and drying with disposable towels between each sampling event. All disposable sampling media will be placed into designated site containers.

Additional detail regarding the operation and calibration procedures for the XRF unit is provided in XRF Standard Operating Procedures included as Attachment B-1 to this FSP.

3.2 Surface Water Samples

If water is present in the F-Pond prior to the start of the corrective measure, a surface sample will be collected to determine the nature and concentration of the contaminants of concern for discharge purposes. Specifically, the contaminants of concern identified during the previous investigations, i.e. lead, iron, manganese, and trichloroethylene (TCE), will be analyzed for. The surface water sample will be collected as follows:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan*.

b. Staging areas for sample collection will be established. Polyethylene sheeting or clean, plastic containers or tubs will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:
   - Field Logbook;
   - Camera and film;
   - Plastic or glass laboratory-supplied sample containers;
   - Sample beakers;
   - Distilled water, low-phosphate detergent, and brushes;
   - Disposable gloves;
   - Trash bags; and
   - 5-gallon buckets or tubs to carry equipment and for decontamination liquids.

c. The clean beaker will be lowered into the surface water to collect a sample. The water will be transferred into the appropriate laboratory-supplied sample container. The sample container will be labeled in accordance with the predetermined sample identification system.

d. Field notes will be completed and will include the identification of the source being sampled, sample number, date, and other pertinent information.

e. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

f. The sample containers will be placed in a sample ice chest for shipment to the laboratory for analysis.

g. All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse. Decontaminated equipment will be wrapped in aluminum foil if not immediately reused to prevent contamination during storage or transportation. All disposable sampling media will be placed into designated site containers.

3.3 Characterization Samples

Characterization samples will be collected from the F-Pond and North Ditch Staging Area to determine if the sediment/soil exhibits the toxicity characteristic for lead and from the F-Pond to determine if the sediment/soil requires excavation based on the total lead and iron concentrations. Five-point composite samples will be collected from the F-Pond and grab samples will be collected from the North Ditch Staging Area from a depth of 0 to 6 inches below ground surface for submittal to an analytical laboratory for analysis of TCLP lead and/or total lead and iron. Samples will also be collected from the in-situ treated sediment/soil in the in-situ treatment areas, in approximate 300 cubic yard intervals, for characterization purposes. Samples will also be collected from the post-excavated surface of these areas in the F-Pond and North Ditch Staging Area for analysis of TCLP lead. Lastly, samples will be collected from stabilized materials in the F-Pond, at a frequency of one sample per 10,000 cubic yards or a minimum of one sample per day of stabilization, to determine compliance with 40 CFR §265.314. These samples will be analyzed

using the Paint Filter Liquids Test by U.S. EPA Method 9095B. The characterization sampling procedures are described below:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan.*

b. The grid, sample point or sediment/soil volume will be selected for sampling.

c. Staging areas for sample collection will be established. Polyethylene sheeting or clean, plastic holding containers or tubs will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:
   - Field Logbook;
   - Camera and film;
   - Plastic or glass laboratory-supplied sample containers;
   - Stainless steel or plastic disposable trowels;
   - Whirl-Pak bag or equivalent sample bags;
   - Stainless steel or plastic bowls;
   - Measuring tape;
   - Distilled water, low-phosphate detergent and brushes;
   - Disposable gloves;
   - Trash bags; and
   - 5-gallon buckets or tubs to carry equipment and for decontamination liquids.

d. For a composite sample, a sufficient amount of soil will be collected with a sample trowel from 4 or 5 locations, as appropriate, within the sediment/soil volume or grid. The soil will be placed in a new, clean sample bag or stainless steel or plastic container for homogenization. The homogenized sample will then be placed into the appropriate laboratory-supplied sample container. For a grab sample, a sufficient amount of soil will be collected with a sample trowel from the sample point location and placed directly into the appropriate laboratory-supplied sample container.

e. Sample containers will be labeled in accordance with the predetermined sample identification system.

f. Field notes will be completed and will include the sample identification number, color and general soil description.

g. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

h. The sample containers will be placed in a sample ice chest for shipment to the laboratory for analysis.

i. All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse. Decontaminated equipment will be wrapped in

aluminum foil if not immediately reused to prevent contamination during storage or transportation. All disposable sampling media will be placed into designated site containers.

3.4 Post-Excavation Confirmation Samples

Upon the successful achievement of the remediation goals as indicated by XRF screening, the post-excavation soil surface in each grid will be sampled to verify that the performance criteria have been achieved. A sample from 0 to 6 inches (0-0.5 feet) in depth will be collected from the post-excavation surface of each grid bottom and sidewall, if present, as depicted in Figures 1 and 2. The samples will be submitted to a laboratory for analysis of total lead and iron for the F-Pond and total lead for the North Ditch Staging Area. Post-excavation confirmation samples will also be collected from the post-excavation surface of the area where sediments/soils exhibited TCLP lead concentrations that exceeded 5 ppm prior to excavation. A sample from 0 to 6 inches in depth will be collected from these locations or grids for analysis of TCLP lead. The post-excavation confirmation sampling procedures are described below:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan.*

b. The grid will be selected for sampling. The grid lines will have been previously marked for visual reference during site preparation activities. Each grid will be recorded and surveyed.

c. Staging areas for sample collection will be established. Polyethylene sheeting or clean, plastic holding containers or tubs will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:
   - Field Logbook;
   - Camera and film;
   - Plastic or glass laboratory-supplied sample containers;
   - Stainless steel or plastic disposable trowels;
   - Whirl-Pak bag or equivalent sample bags;
   - Stainless steel or plastic bowls;
   - Measuring tape;
   - Distilled water, low-phosphate detergent and brushes;
   - Disposable gloves;
   - Trash bags; and
   - 5-gallon buckets or tubs to carry equipment and for decontamination liquids.

d. For a composite sample, a sufficient amount of soil will be collected with a sample trowel from 4 locations, as appropriate, within the grid. The soil will be placed in a new, clean sample bag or stainless steel or plastic container for homogenization. The homogenized sample will then be placed into the appropriate laboratory-supplied sample container. For a grab sample, a sufficient amount of soil will be collected with a sample trowel from the sample point location and placed directly into the appropriate laboratory-supplied sample container. The sample container will be labeled in accordance with the predetermined sample identification system.

e. Field notes will be completed and will include the sample identification number, color and general soil description.

f. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

g. The sample containers will be placed in a sample ice chest for shipment to the laboratory for analysis.

h. All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse. Decontaminated equipment will be wrapped in aluminum foil if not immediately reused to prevent contamination during storage or transportation. All disposable sampling media will be placed into designated site containers.

3.5 Backfill/Topsoil Material Samples

Samples of backfill or topsoil material will be collected according to the following procedures. Each source of backfill or topsoil material will be sampled before the anticipated use of the material.

The sample will consist of a composite sample of at least four aliquots obtained directly from the source area, stockpiled material from the source area, or from a clean container of at least 10 pounds of material. The sample will be analyzed for total RCRA metals, including arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver; and total petroleum hydrocarbons (TPH). The total RCRA 8 metals results will be compared to the Illinois TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties and the TPH concentration will not exceed 100 ppm. If the TPH concentration exceeds 100 ppm, then the sample will be analyzed for SVOCs and the results will be compared to the Illinois TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties. If the results are less than the applicable TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties, then the backfill source will be deemed clean for use. The source location of the backfill and topsoil materials will be documented by source location and address. The backfill/topsoil material samples will be collected as follows:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan*.

b. Staging areas for sample collection will be established. Polyethylene sheeting or clean, plastic containers or tubs will be placed adjacent to the areas to be sampled during sample collection. The following tools and supplies will be prepared for use:
   - Field Logbook;
   - Camera and film;
   - Plastic or glass laboratory-supplied sample containers;
   - Stainless steel or plastic disposable trowels;
   - Whirl-Pak bag or equivalent sample bags;
   - Stainless steel or plastic bowls;

- Measuring tape;
- Distilled water, low-phosphate detergent and brushes;
- Disposable gloves;
- Trash bags; and
- 5-gallon buckets or tubs to carry equipment and for decontamination liquids.

c. A sufficient amount of soil will be retrieved from 4 locations with a sample trowel and placed into a new, clean sample bag or stainless steel or plastic container for homogenization.

d. The homogenized sample will be placed into the appropriate laboratory-supplied sample container. Sample containers will be labeled in accordance with the predetermined sample identification system.

e. Field notes will be completed and will include the identification and storage location of the source being sampled, sample number, date, and other pertinent information.

f. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

g. The sample containers will placed in a sample ice chest for shipment to the laboratory for analysis.

h. All reusable sampling equipment will be decontaminated utilizing a detergent wash and potable water rinse, followed by a distilled water rinse. Decontaminated equipment will be wrapped in aluminum foil if not immediately reused to prevent contamination during storage or transportation. All disposable sampling media will be placed into designated site containers.

3.6 Groundwater Samples

Groundwater samples will be collected on a quarterly basis for a period of one year from three monitoring wells associated with the F-Pond and four monitoring wells associated with the North Ditch Staging Area, as described in the *CMI Workplan*. The samples will be submitted to a laboratory for analysis of total lead. The groundwater sampling procedures are described below.

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan*.

b. The necessary equipment will be assembled and its operating condition verified, and properly cleaned. Arrangements will be made for the repair or replacement of any equipment that is determined to be inoperative.

c. All portions of sampling equipment that will contact the interior well casing will be thoroughly cleaned before each use. This includes water-level tapes or probes, pumps, tubing, bailers, lifting line, and other equipment or portions thereof which will be immersed. The procedure for equipment cleaning is as follows: clean sampling equipment with tap water and low phosphate detergent, brush if necessary; rinse thoroughly with tap water; rinse thoroughly with distilled

water; and wrap cleaned equipment in paper towels for transport. All non-dedicated sampling equipment should be thoroughly cleaned before and between use at different sampling locations.

d. Water levels and the total depths will be measured in each well before well development, purging or sampling. Prior to the measurements, each well will be inspected thoroughly for signs of damage. Any damage to the well will be noted in the field logbook. Using a pre-cleaned water level meter, the groundwater surface will be measured from the casing datum to the nearest 1/8 inch (0.01 foot). The probe will then be lowered to measure the well's total depth. These measurements will be recorded in the field logbook.

e. Each well may be redeveloped before purging and sampling, if the monitoring wells have not been recently developed. If necessary, each well will be redeveloped using a 2-inch centrifugal pump, connected to a clear reinforced plastic drop line. The drop line will have a collar (such as a segment of PVC pipe) attached to it with a diameter of approximately 1 to 1.5 inches. A small foot valve will be attached to the bottom of the drop line. The suction of the pump will be regulated by a small ball valve inserted between the drop tube and the pump. A discharge line from the pump will be routed to a 55-gallon drum. Well development will occur by pumping water from the well and periodically pulling upward on the drop tube, which will surge the sand pack and draw groundwater into the well. The constant pull of the pump will remove fine particles as they flow through the well. This process will continue until either the discharge flow is clear or until 50 gallons of water have been purged from the well. Observations during redevelopment will be recorded in the field logbook. After redevelopment, each well will be allowed to stand undisturbed for a period of at least 1 day before purging and sampling. Pumps used for development will be decontaminated between wells by cleaning all outside surfaces of the drop line or tubing with a phosphate-free detergent wash and distilled water rinse. The pump will be cleaned internally by running at least 10 gallons of clean distilled water through the pump before the next use.

f. Each well will be purged using a peristaltic pump and low-flow technique to minimize mixing between the overlying stagnant casing water and water within the screened interval. A dedicated, decontaminated drop line will be attached to the pump. The pump will either be a peristaltic pump (for water levels less than 28 feet below ground surface), electric positive displacement or bladder-style pump. The line or pump inlet will be placed in the approximate middle of the screened interval. The discharge end of the line will be attached to a flow-though cell holding the various field measurement probes. The pump will then be turned on and measurements started for flow rate and field parameters. A pumping rate of between 0.1 – 0.5 L/min will be maintained and the turbidity, pH, specific conductivity, and temperature of the purge water will be recorded to determine when the well has been adequately purged (stabilized). The pump drop line will be changed between wells. The pump rate and the parameter measurements will be recorded on the groundwater sampling record form. Each field instrument will be calibrated according to manufacturer instructions prior to use.

g. Sample extraction will be accomplished by using the peristaltic pump and line previously used to purge the well. For total metals samples, the sample bottle will be filled directly from the pump line. For dissolved metals, the sample will be filtered through a 0.10-micron filter. The groundwater samples will be placed in the appropriate laboratory-supplied sample containers. Excess water collected during sampling will be placed in 55-gallon drum for proper handling and disposal.

h. Field notes will be completed and will include the name of site, sample identification, date and time of sample collection, media sampled, name of sampler, preservatives, and types of analyses to be performed.

i. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

j. The sample containers will be placed on ice in a sample ice chest for shipment to the laboratory for analysis.

3.7 Quality Assurance Samples

Samples collected for quality assurance purposes will include field rinsate blanks, field duplicates and matrix spike/matrix spike duplicates. The sampling procedures for these samples are described below. Additional discussion of these types of samples is provided in the QAPP, which includes a discussion of data evaluation and corrections or changes to the field program, depending on the sample results.

3.7.1 Rinsate Blank Samples

Rinsate blanks are water samples obtained by rinsing decontaminated, non-disposable sampling equipment with contaminant-free distilled water, and capturing that water in sample containers for laboratory analysis. These blanks verify the effectiveness of equipment cleaning procedures and are integral to the QA/QC program. Rinsate blanks will be collected at a frequency of 1 rinsate blank per day of sampling when using non-dedicated, non-disposable equipment. The rinsate blanks will be analyzed for the appropriate constituents of concern based on the unit being sampled at the time. Sample test methods and sample container requirements are listed on Table 1 of the QAPP. The rinsate blank sampling procedures are described below:

a. The sampling team will adhere to the health and safety protocols defined in the *Site-specific Health and Safety Plan*.

b. Staging areas for sample collection will be established. Polyethylene sheeting or clean, plastic containers or tubs will be placed adjacent to the area for obtaining the blank. This area should preferably be away from known contaminated areas to avoid cross-contamination of the sampling tools. The following tools and supplies will be prepared for use:
   - Field Logbook;
   - Camera and film;

- Accumulation of sampling tools and devices used;
- Plastic or glass laboratory-supplied sample containers;
- Sample beakers;
- Distilled water, low-phosphate detergent, and brushes;
- Disposable gloves;
- Trash bags; and
- 5-gallon buckets or tubs to carry equipment and for decontamination liquids.

c. Decontaminated sampling devices will be gathered. Distilled water will be poured over the just decontaminated sampling device and the runoff water will be collected directly into the sample container.

d. Field notes will be completed and will include the sample identification number, date and other pertinent information.

e. Chain-of-custody documents will be prepared according to procedures outlined in the QAPP.

f. Sample containers will be labeled in accordance with the predetermined sample identification system and the samples will be placed in a sample ice chest for shipment to the laboratory for analysis.

3.7.2 Field Duplicate Samples

Duplicate samples are collected as two sets of sample bottles filled from a single sample location. The sample is split in the field in a manner to ensure that the chemistry is as close to identical as possible. One sample, the "parent" sample, is labeled as usual. The duplicate sample is labeled with an "X", in addition to the usual sample identification. The purpose of the duplicate is to test the ability to generate reproducible samples. One duplicate will be collected for every 10 samples generated during the project, with the exception of TCLP samples. The duplicate sample will be analyzed for the same parameter suite as the parent sample. The field procedure simply involves filling a second set of containers and placing a notation in the field log about the duplicate sample.

3.7.3 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spikes provide information about the effect of the sample matrix on the digestion and measurement methodology. All matrix spikes are performed in duplicate and are referred to as MS/MSD samples. One MS/MSD sample will be analyzed for every 20 or fewer samples per sample matrix.

4.0 SAMPLE HANDLING AND ANALYSIS

4.1 Analytical Methods

The following analytical methods will be used for the samples to be collected during the corrective measures: total lead and iron in soil by U.S. EPA Method SW-846 3051/6010B; TCLP lead in soil by U.S. EPA Method SW-846 1311/6010B; total lead, iron, and/or manganese in water by U.S. EPA Method SW-846 3010A/6010B; and trichloroethene in water by U.S. EPA Method SW-846 8260B. A complete description of the methods, including preservative requirements, holding times, detection limits, container types, and sample sizes are included in Table 1 of the QAPP.

4.2 Detection Limit Requirements

The level of concern for each parameter directly affects the data quality requirements. Therefore, the sampling and analysis methods must be accurate at the level of concern. Furthermore, it is necessary that the analytical technique chosen has a detection limit well below the level of concern. Analytical methods that can accurately quantify constituents below their levels of concern will be used for the sample analyses. The detection limits will generally be much lower than the levels of concern. It is necessary that data quality objectives be consistent with clean-up levels or other levels.

Therefore, analytical detection limits should be less than the level of concern for each constituent and will be selected so that any analyzed parameter result can be compared to the appropriate level. The QAPP discusses the planned detection limits for analyses along with the methods to be used for this investigation in order to address the various levels for comparison.

4.3 Sample Handling

4.3.1 Chain-of-Custody Procedures

Proper documentation of sample collection and the methods used to control these documents are referred to as Chain-of-Custody (COC) procedures. COC procedures are essential for presentation of sample analytical results as evidence in litigation or at administrative hearings conducted by regulatory agencies. COC procedures also serve to minimize loss or misidentification of samples and to ensure that unauthorized persons do not tamper with collected samples. The QAPP describes all COC procedures for both field use and laboratory use. An example COC record form is also presented in the QAPP.

4.3.2 Sample Shipping

For shipping, all samples will be packaged in such a manner as to prevent damage or breakage during shipment or transport. Water samples will be required to be packed in ice. Samples not delivered to the laboratory will be shipped through an overnight parcel service by sampling personnel. Samples will be placed into suitable containers, labeled and sealed in such a manner that tampering with the seal would be

obvious. All sample holding times will be tracked and a copy of the COC form will accompany the samples in a sealed plastic bag. Sample shipping is further discussed in the QAPP.

5.0 FIELD INSTRUMENT MAINTENANCE AND CALIBRATION

5.1 X-Ray Fluorescence Analyzer

The NITON XL 700 Series X-Ray Fluorescence (XRF) analyzer will be the instrument utilized for screening total lead and iron concentrations in soil. The XRF analyzer utilizes two to three radioisotope sources. Each source emits a different energy (wavelength) of radiation, which provides efficient analysis of specific ranges of elements. A 60-second scan time will be utilized to field screen samples for the duration of the remedial action. Only qualified analysts trained in the proper use, theory, and safety of XRF analysis will operate this system.

The principle of XRF analysis is based on electron excitation. Elemental atoms in a soil sample are irradiated with a beam of X-Rays. Electrons in the atoms at lower lying energy levels are excited to higher energy levels. The vacancies left in the inner electron orbitals make the atom unstable. Relaxation to the ground state occurs, resulting in the emission of X-Rays characteristic of the excited elements. Thus, by examining the energies of the X-Rays emitted by the irradiated soil sample, identification of elements present in the sample is possible.

Comparing the intensities of the X-Rays emitted from a given sample to those emitted from reference standards with known analyte concentrations allows quantification of the elements present in the samples. Prior to any on-site activities, the XRF analyzer will be properly calibrated in order to allow for accurate sample analysis. During on-site activities, the XRF will be subject to routine, quality control checks as described in the QAPP. A Standard Operating Procedure (SOP) for the XRF is presented in Attachment B-1 of this FSP.

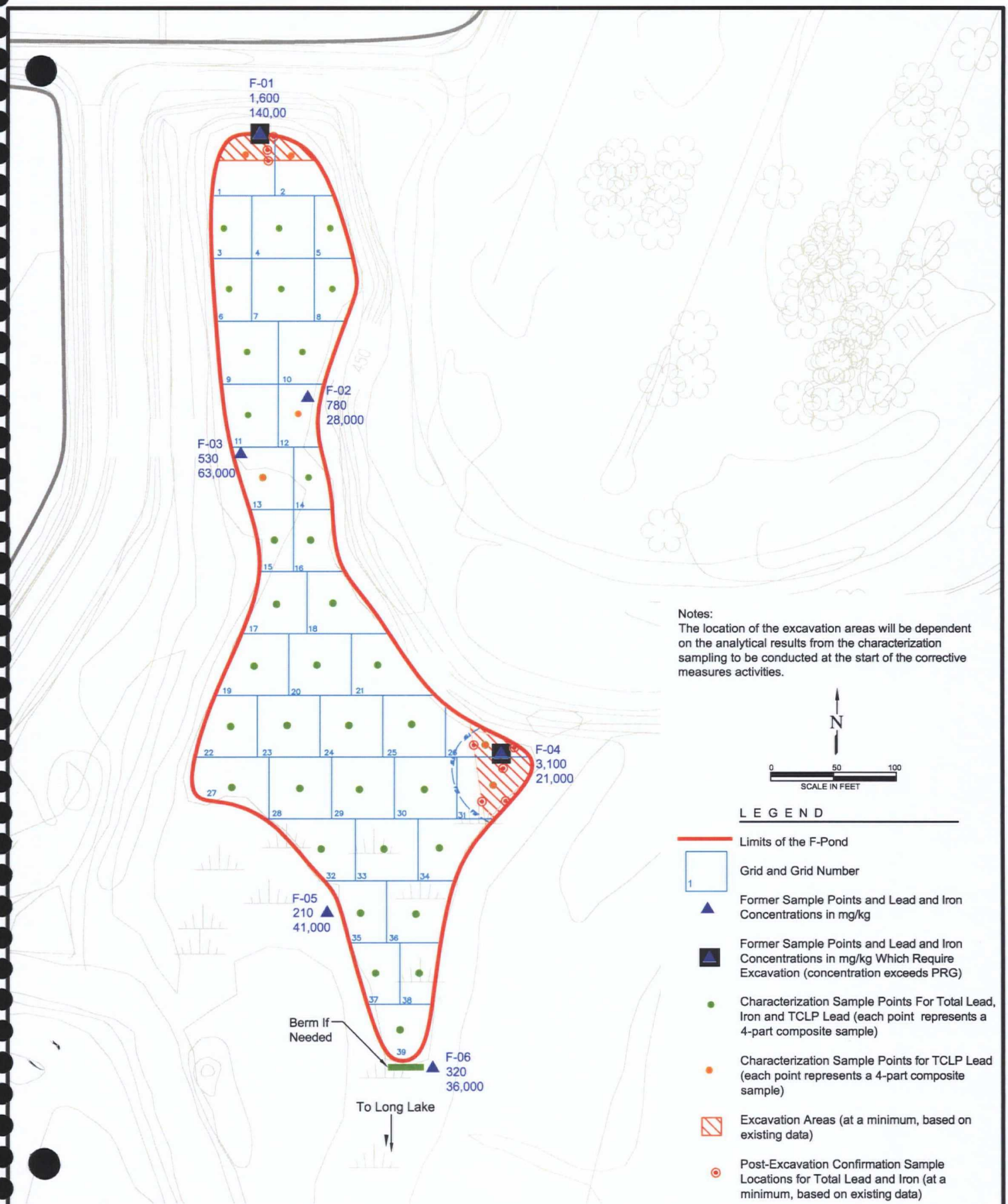
5.2 Water Level Indicator, Turbidity Meter, and Water Quality Parameter Probes

The HACH Portable Turbidimeter Model 2100P will be the instrument used to measure the turbidity of the purge water. The YSI 556 Multi-Probe System or YSI Model 85 will be the instrument used to measure the water quality parameters of pH, specific conductivity and temperature in the purge water. The Keck Instruments or Solinist Water Level Indicator will be the instrument used to measure the water levels and total depths of the monitoring wells. These instruments will be calibrated and operated in accordance with the manufacturer's specifications provided in the instrument manuals.

6.0 FIELD DOCUMENTATION

Logs of daily activities will be used to record sampling activities. Since there will be several different types of sampling activities being performed (XRF, soil and groundwater), possibly at the same time, there will be several logbooks. These books will be bound and have consecutively numbered pages. Entries in the field logbook will be made in waterproof ink and will include: the name of the author, date and time of entry, location of activity, daily weather report, names and affiliations of personnel on-site, sample collection or measurement methods, equipment calibration information, number of samples collected, sample identification numbers, sampling depth increment for soils, field observation and comments, field measurements, locations of photographs, and any deviations from the sampling plan including why the deviation was necessary and any expected impacts on the results of the CMI or laboratory analyses. The field logbook will be stored in the document control center at the job site when it is not in use. Upon project completion, all logbooks will become part of the file records.

FIGURES



Notes:
The location of the excavation areas will be dependent on the analytical results from the characterization sampling to be conducted at the start of the corrective measures activities.

N

0 50 100

SCALE IN FEET

LEGEND

- Limits of the F-Pond
- Grid and Grid Number
- Former Sample Points and Lead and Iron Concentrations in mg/kg
- Former Sample Points and Lead and Iron Concentrations in mg/kg Which Require Excavation (concentration exceeds PRG)
- Characterization Sample Points For Total Lead, Iron and TCLP Lead (each point represents a 4-part composite sample)
- Characterization Sample Points for TCLP Lead (each point represents a 4-part composite sample)
- Excavation Areas (at a minimum, based on existing data)
- Post-Excavation Confirmation Sample Locations for Total Lead and Iron (at a minimum, based on existing data)

Base map taken from "Environmental Indicators Assessment Report" dated January 2002.

F-POND
GRID SYSTEM MAP

KEYSTONE STEEL & WIRE
PEORIA, ILLINOIS

FIGURE 1

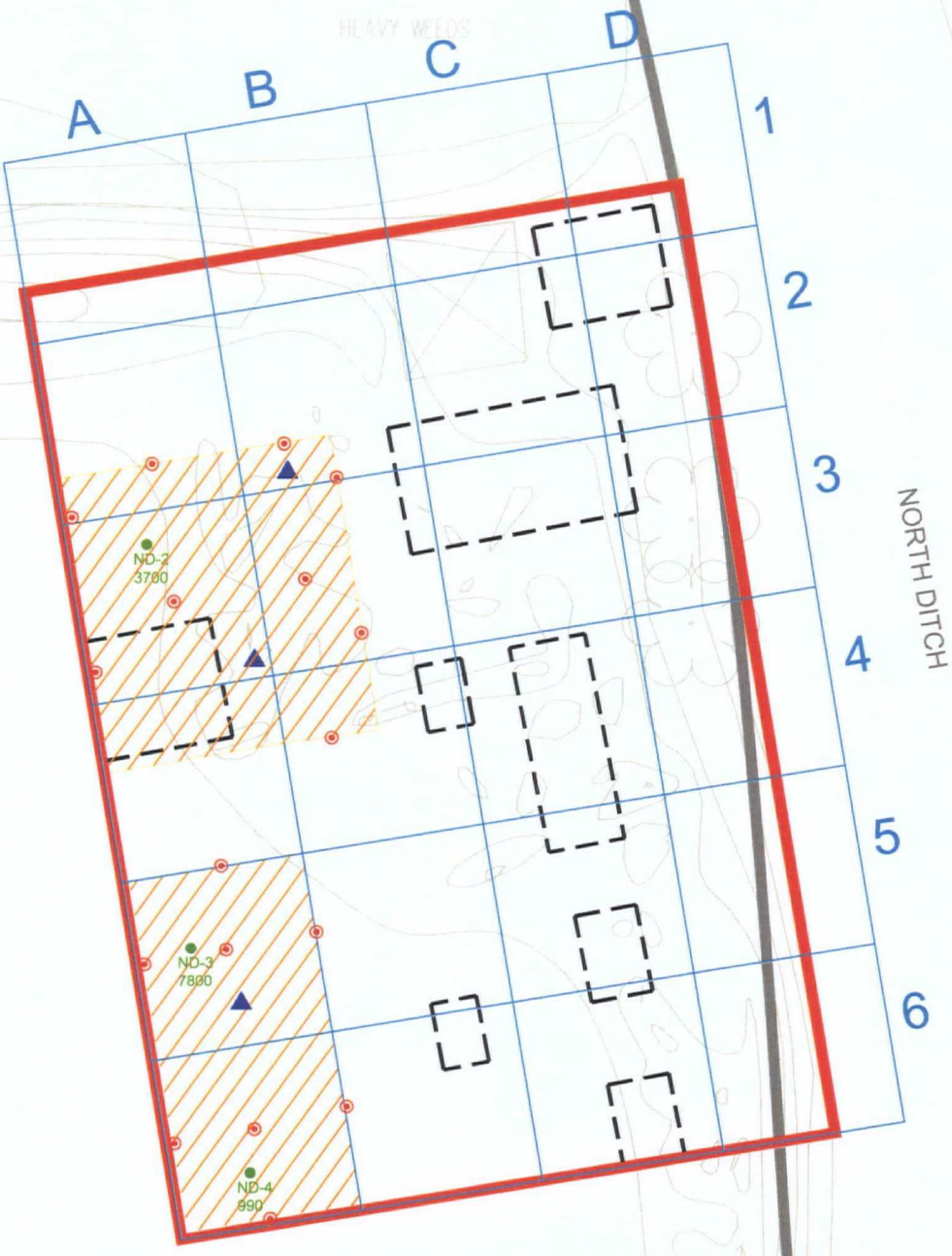
NO.	DATE	REVISION	APP.

Scale: 1"=50' | Drawn By: — | Checked By: — | Date: 11-26-04

ENTACT environmentalservices

4040 W. Royal Ln. • Suite 139 • Irving, TX 75063
(972) 580-1323 • Fax (972) 580-7464
Dallas • Houston • Chicago • Atlanta

\Projects\Keystone Peoria IL\Drawings\keystone-012 CMI FSP.dwg, entact entact



Notes:
The location of the excavation will be dependent on the analytical results from the characterization sampling to be conducted at the start of the corrective measures activities.

LEGEND

- Limits of North Ditch Staging Area
- Locations of Former Treatment System Structures
- December 2002 Sample Locations and Lead Concentrations in mg/kg (concentration exceeds PRG) and Location of Characterization Samples
- Former Sample Points (concentration exceeds PRG)
- 50 x 50 Foot Grid
- Excavation Areas
- Post-excavation Confirmation Sample Location and ID for Total Lead

N

0 25 50
SCALE IN FEET

Base map taken from "Final Corrective Measures Proposal" dated January 2003.

NORTH DITCH STAGING AREA GRID SYSTEM MAP

KEYSTONE STEEL & WIRE
PEORIA, ILLINOIS

FIGURE 2

NO.	DATE	REVISION	APP.

Scale: 1"=50' Drawn By: — Checked By: — Date: 11-24-04

ENTACT
environmentalservices

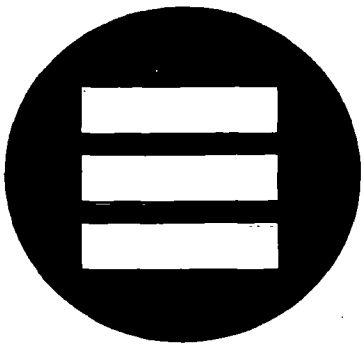
4040 W. Royal Ln. • Suite 138 • Irving, TX 75063
(972) 580-1323 • Fax (972) 580-7484
Dallas • Houston • Chicago • Atlanta

\Projects\Keystone Peoria IL\Drawings\keystone-012 CMI FSP.dwg, entact entact

ATTACHMENT B-1

XRF STANDARD OPERATING PROCEDURES

ENTACT SERVICES, LLC



XRF STANDARD OPERATING PROCEDURES

Niton XL 700 Series

ENTACT Services, LLC
3129 Bass Pro Drive
Grapevine, Texas 76051
(972) 580-1323

January 2005

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STANDARD OPERATING PROCEDURES FOR NITON XL 700 SERIES XRF ANALYZER

1.0 Radiation Safety

NITON has designed its XRF analyzers so that there is virtually no measurable radiation external to any part of the instrument when the shutter is closed. When NITON instruments are used according to instructions, there is minimal radiation exposure even with the shutter open. NITON XRFs contain sealed cadmium-109 radioactive sources. The source is designed to remain secure even under extreme conditions, so that even if the instrument is broken, crushed or burned, there will be no leakage of radioactive material.

During manufacturing, each sealed source is placed in a solid metal source holder. A plug is screwed into the access hole and secured with a set screw and Locktite. The source is completely secure in its housing because the aperture at the other end of the housing is smaller than the source. The small aperture is sealed with a beryllium metal window that is transparent to the cadmium x-rays and gamma-rays. The source assembly is secured in the NITON's aluminum case. The case has tamper proof screws.

2.0 How To Use Your NITON Safely

Each NITON is designed to be safe as possible. However, we strongly recommend that you follow these precautions to insure your safety and the safety of those around you.

- Always be aware of the location of your instrument's radioactive source and the direction of its beam of x-rays. The location of the source and the direction of its beam are both clearly marked on the front and top side of your NITON.
- Open the shutter *only* to do a test.
- During testing, a strong beam of radiation (gamma-rays and x-rays) is continuously emitted through the beryllium window at the bottom of the NITON. There will be some radiation at the front and top-front of the instrument. There is negligible radiation where your hand should be holding the instrument.

Warning: Always treat radiation with respect. Do not put your hand on the top end of the NITON while measuring. Never point the instrument at yourself or anyone else when the shutter is open.

2.1 Shutter Safety

Your NITON is designed so you cannot accidentally open the shutter or leave it open accidentally when you lift the instrument from a surface. To open the NITON's shutter and to keep it open, the instrument must be held against a surface. The shutter will close as soon as you cease to hold your NITON against a surface.

- The shutter should be open only during a test.
- Under no circumstances should the shutter be open when the instrument is not in use.
- Your NITON clearly indicates any time the shutter is open. The plunger will stick up through the instrument case whenever the shutter is open.

Warning: In the unlikely event that the plunger gets stuck in the open position, simply push it closed. Then call the NITON Service Department at 401-294-1234.

2.2 Monitoring Your Radiation Exposure

There is virtually no measurable radiation from a NITON when its shutter is closed. The maximum dosage to which you are exposed when properly operating your NITON is 0.1 mR/hr on the fingers of the hand holding the instrument with the shutter open.

As an additional precaution to insure that your radiation exposure is always minimal, NITON strongly recommends that you wear a dosimeter at all times when using the instrument.

Note: Your state may have regulations concerning radiation monitoring.

A dosimeter badge is usually worn close to the parts of your body that are most sensitive to radiation, including your reproductive organs and your eyes.

Warning: Wearing a dosimeter badge does not protect you against current exposure. A dosimeter badge measures your exposure after the fact. If, at any time, you find measurable exposure, call NITON immediately at (401) 294-1234.

Warning: Pregnant female associates may want to take special precautions to reduce their exposure to radiation. Qualified scientists have recommended that the radiation dose to pregnant women should not exceed 500 mR/gestation period.

3.0 Principles of Radiation Safety

Your exposure to radiation is related to three factors: time, distance, and shielding. Human exposure to radiation is typically measured in rems, or in one-thousandths of a rem, called millirems (mR).

The allowable limit in the United States for occupational exposure is 5,000 mR/year for a whole-body and 50,000 mR for shallow penetration of extremities. Exposure from a properly used NITON will be less than 50 mR per year, even if the instrument is used 2,000 hours per year.

For a given source of radiation three factors will determine the radiation dosage you receive from the source:

3.1 Duration of Exposure

The longer you are exposed to a source of radiation the more radiation strikes your body and the greater the dose you receive. Dosage increases in direct proportion to the length of exposure.

3.2 Distance From the Source

The closer you are to a source of radiation, the more radiation strikes. The dosage increases in inverse-squared relation to the distance from the source. For example, the radiation dose on inch from a source is *nine* times greater than the dose three inches from the source, and *144* times greater than the dose one foot from the source. Keep your hand away from the source-end of your NITON when the shutter is open to minimize your exposure.

3.3 Shielding

Every NITON XRF emits virtually no radiation with the shutter closed because the cadmium-109 source is thoroughly shielded in every direction. This shielding absorbs nearly all of the radiation produced by the source – except when the shutter is open during testing. With the shutter open, the instrument emits a direct radiation beam of about one mR/hr intensity; the direction is clearly indicated by the diagram on the front of the NITON. Always hold your NITON so as to avoid the radiation beam.

4.0 Safe Operation of the Multi-Source Analyzer

The multi-source instruments can have any combination of Cd-109, Am-241, and/or Fe-55. These sources are changed by the operation of a thumb-wheel. This thumb-wheel is located on the front (shutter) end of the instrument. There is a position for each source installed, in addition to a position with no source in place. The two source holder has three positions, and the three source holder has four positions. Position is confirmed by the thumb-wheel "clicking" into place. The Cd-109 is indicated by a blue indicator dot on the thumb-wheel. The Am-241 is indicated by a yellow indicator dot on the thumb-wheel. The Fe-55 is indicated by a red indicator dot on the thumb-wheel. The source that is in position will be displayed on the screen of the instrument.

The operation of the thumb-wheel in no way affects the operation of the instrument shutter. The thumb-wheel must only be operated either with the shutter closed or while the instrument is positioned on a sample. Follow all instructions concerning the operation of the shutter as the single source instrument.

5.0 Niton XL 700 Series User Guide

5.1 Components

5.1.1 NITON unit

A sealed aluminum enclosure containing a high-resolution detector and one or two x-ray excitation sources (Cd-109 and Am-241). The aluminum enclosure shields the radiation sources until the "ON" mechanism is activated for analysis. The unit provides data acquisition, processing, and display capabilities. The computer contains:

- Math coprocessor for fast calculation;
- Memory to store up to 1,000 bulk mode test results;
- RS-232 port to transfer data to another computer;
- Graphics allows viewing and qualitative analysis of the x-ray spectra; and
- Replaceable and rechargeable battery pack.

The probe contains radioactive material. Before using you must review the radiation safety procedures.

5.1.2 Accessories

- Interconnecting cable;
- Battery charger;
- Spare battery;
- RS-232 interface cable;
- Test platform;
- Barcode light pen; and
- Soil test kit, which includes the test guard; sample cup kit; mortar, pestle, and grinding mill; and #10, #60, and #120 mesh sieves.

5.2 Use and Storage of the XRF

5.2.1 ENTACT Units

ENTACT's XRF units are generally licensed to Dallas. The units are to be permanently stored in Dallas. The XRFs can be transported to and temporarily stored in another state without the state being notified. If the XRF is going to be transported to and stored in another state for longer than six months, that state must be contacted to determine the process involved with registering the XRF. ENTACT has a general license agreement in Texas and reciprocity in several other states.

5.2.2 Units and Location

Dallas Office **3129 Bass Pro Drive** **Grapevine, Texas**
U3926KY178

Dallas Office 3129 Bass Pro Drive Grapevine, Texas
U38707178LY
U38377173LY
U4332MG469
U4331MG464

5.2.3 Storage Facilities

All units will be used and stored properly to protect health and minimize danger to life or property. All license material will be the responsibility of the operator while it is being utilized. During transportation and storage the license material will be in a locked, secured case. XRF devices will be physically supervised by an authorized user during utilization of the device and the device will be locked in a secure enclosure when not in use. Residence storage will be in a locked enclosure at the Dallas office. A check-out and return format for all radiation devices units must be utilized. Documentation is maintained at the Dallas office with copies of pertinent information such as the confirmation of the leak test included with the instrument.

If the vehicle is a passenger car, the XRF will be stored in the trunk, blocked and braced to prevent shifting during transport. If transported in an open bed vehicle, the device will be locked in a steel cabinet, bolted to the bed of the truck.

5.2.4 Utilization Log

A utilization log will be maintained by the RSO by unit number. The XRF will not be assigned to an operator until this form is completed. When the XRF is returned the operator (responsible person) must return the unit to the permanent storage area and complete the XRF Tracking and Utilization Log.

5.2.5 Leak Testing

All NITON XL 700 Series units will be set up on a six-month interval for leak testing with the manufacturer of the equipment. The leak test will be quantitative using instrumentation sensitive to detect 0.005 microcurie of radiation.

ENTACT will utilize a commercial leak test kit supplied by the NITON Corporation. The RSO will take the smear and forward it to the NITON Corporation who will report the results back to the RSO.

NITON Corporation
1130 Ten Rod Road, Bldg C Suite 207
North Kingstown, RI 02852
(401) 294-1234

5.2.6 Maintenance

Routine cleaning after each use will be the responsibility of the operator. Proper care and handling of this

equipment is the full responsibility of the operator. The operator must verify the condition of the unit when it leaves and document any changes to that condition when the unit is returned. Routine cleaning is included as part of the operator's responsibility. All associates will receive radiation safety training prior to working with any radiation equipment.

ONLY THE MANUFACTURER WILL PERFORM MAINTENANCE ON THE NITON XL 700 SERIES UNITS.

5.2.7 Transportation

All NITON instruments come in waterproof, drop-proof carrying cases with padlocks. NITON instruments can be transported by car or plane or shipped as an ordinary package. No notification is required for transportation except the following: There may be disclosure and/or licensing requirements if you take the NITON instrument across state or national boundaries.

Your NITON is an "excepted" instrument, which requires no special labeling on the outside of case or packaging. A compliance statement must be kept with the instrument case. Always transport the unit in its carrying case and keep the NITON in its case whenever it is not being used.

5.2.8 Operator Responsibilities and Training

- All operators shall have completed required training.
- Make complete entries onto the utilization log.
- Obtain keys to storage and remove the device. Make sure that the source is in the safe (shielded) position.
- Lock device in its carrying case and lock in transport vehicle.
- Never leave device unattended at the job site unless it is secured in locked storage to which only authorized users have a key.
- Clear area of all unnecessary persons before using the device.
- Work safely with device following manufacturers operating procedures and utilizing the radiation safety principles of time, distance, and shielding. Do not expose yourself or others to the unshielded source. Stand back from the device when possible.
- When the job is finished, make sure the source holder is locked in the "off" or closed position and lock the device in the carrying case. Place the carrying case in locked storage (such as trunk of car), to which only authorized users have a key.
- Return the device to the permanent storage place and lock it up.
- Complete the utilization log with time-in and signature.
- Report any device malfunctions, unusual occurrences, or difficulties in using a device to the Radiation Safety Officer.
- Proper maintenance of the unit.

5.3 Operating Information

5.3.1 Sources

Two sources located in the NITON:

Activity		
Cd-109	2.5 years change element	4 mci
Am-241	Never	5 mci

5.3.2 Main Power Battery

- Rechargeable Nickel Metal Hydride battery pack.
- Battery will last eight or more hours of continuous use.
- The battery should be run to low condition and then charged with a full 2-1/2 hour charge.
- Auxiliary batteries should not be charged continuously. Overnight recharging is recommended.
- NITON battery packs can be recharged at least 500 times.
- NITONS' Nickel Metal Hydride battery packs discharge at a rate of about 2% per day when not in use.
- Store the charger and battery packs in a cool place away from direct sunlight.
- When a battery pack is not used for a long period of time, it will lose its charge completely. Fully recharge it before use.
- A lithium backup battery inside your NITON will prevent any loss of data should you need to change the battery pack before downloading readings.

5.3.3 Parameters to be Measured

All metals on the periodic table of elements ranging from Sulfur to Uranium.

5.3.4 Range of Measurement

NITON's XRFs are calibrated to give accurate values for most elements in concentration of 10,000 ppm or less. This is because the linear range of the Compton Normalization Method is from 0 ppm to approximately 10,000 ppm (1%). For actual concentrations of 10,000 ppm to 20,000 ppm (1% to 2%), NITON's XRF may overstate the elemental concentration. For content above 20,000 ppm (2%), readings may exhibit even greater deviation.

5.3.5 Detection Limit

The detection limit varies with each analysis. The detection limit for each analysis is three times the XRF calculated standard deviation.

Example:
The XRF calculated standard deviation is 5 ppm.
5 X 3 = 15
The detection limit is 15 ppm.

5.4 Interferences and Corrective Actions

5.4.1 Moisture

- Interference - High moisture content (approximately 25% moisture) of muds and sludges can cause erroneous results.
- Corrective Action - Soils containing high moisture content should be dried prior to analysis. Dry soil should be placed in a sample cup for testing.

5.4.2 Matrix Effects

- Interference - Physical characteristics such as particle size and homogeneity can affect the accuracy of the analysis.
- Corrective Action - Whenever a new matrix is encountered, a sample should be analyzed by both XRF and the laboratory analysis to ensure the NITON accurately analyzes the constituents in the matrix.

5.4.3 Placement

- Interference - If the NITON is not placed on a flat uniform soil location, errors can result from the distance between the probe and the soil.
- Corrective Action - Ensure with each measurement that the NITON is placed flat against a uniform flat surface.

5.5 Sample Presentation and Preparation

Sample presentation is the positioning of the sample with respect to the source window. Proper and consistent presentation is essential for accurate analytical results.

Ideally, the sample should be flat, larger than 1" in diameter, and should be placed in contact with the source window. For flat metal plates, sheets of plastic and paper, this is easily achieved. Other sample forms such as liquids or powders must be contained for presentation to the source.

Large solid samples are most easily analyzed by placing the NITON unit directly on the sample (in-situ analysis). For small samples, it is usually more convenient to set up the unit on a table.

5.5.1 Sample Cups

Liquids, powders and/or soils should be presented using sample cups. These cups are made up of three pieces: a cup, a ring and a piece of Mylar film.

To load a sample cup:

- Place a circle of mylar film on top of the sample cup. This film goes on the end of the cup with the indented ring. Secure the film with the collar. The flange inside the collar faces down and snaps into the indented ring of the cup. Inspect the installed film window for continuity and smooth, taut appearance.
- **Note: Wrinkles cause part of the sample to be held away from the face of the probe and can interfere with analysis. For maximum accuracy the film must be taut and free of wrinkles.**

- Set the cup on a flat surface film-window side down. Fill it with at least three grams of the prepared sample (no more than half full). Take care that there are no voids or layering.
- Tamp the sample into the cup.
- Fill the rest of the cup with polyester fiber stuffing to prevent sample movement.
- Fasten the cap on the cup. Using an indelible pen, write an identifying number on the cup.
- Turn the filled and sealed sample cup upside down and, if the sample is powdered, tape the cup on the bench to thoroughly settle and compact the contents.
- The sample is now ready to be placed film side up in the test platform.
- **Note: Make certain the sample cup rests in contact with the source window, otherwise significant analysis errors may result.**

5.5.2 In-situ Analysis

In-situ analysis is appropriate for soils, manufactured items, and large objects. In other words, anytime it's easier to take the analyzer to the sample than it is to bring the sample to the analyzer.

The majority of our samples will be in-situ soil analysis. The best results are obtained on reasonably dry, flat, compacted surfaces of fine-grained soils. Whenever possible, flatten and compact the area to be measured with an appropriate tool. Good results can be obtained at moisture contents up to about 25% (beyond this point the soil is wet mud and must be contained in a sample cup). In-situ analysis of wet mud will grossly contaminate the source window, invalidating all subsequent measurements until the windows are cleaned.

The source window and test guard window can be punctured. Clear the test areas of sharp, hard, or protruding objects (for example, twigs or rocks). Failure to clear the test area can result in damage to the instrument.

Coarse-grained soil conditions may not permit a truly representative sample and may adversely affect the analysis results. Such samples should be prepared before analysis.

5.5.3 Sample Preparation

Sample preparation is the treatment given to the "as received" sample to make it suitable for XRF analysis. Most samples require little or no sample preparation. Homogeneous solids, clear solutions and finely ground powders (<200 mesh) can be accurately analyzed with no preparation (other than filling the sample cup).

Samples consisting of material with large particle sizes and variations in particle size can be prepared prior to analysis to yield a more accurate reading. Samples can be ground to break up dirt clods and passed through a #10, #60 and/or #120 mesh sieves to remove large particles which require additional grinding. The sample can be homogenized through mixing and then placed in a sample cup for XRF analysis. (The soil kit includes the equipment required for sample preparation.)

5.5.4 Solid or Bagged Bulk Samples

Solid samples (sheets of metal, plastic or paper, for example) can usually be analyzed without preparation. The size of the sample will determine whether you use the test platform or in-situ analysis. The analyzed surface of the sample should be relatively clean, since many element's x-rays will not penetrate a thick layer of dirt. (Of course, if the sample is a thick layer of dirt it should remain, well, dirty.) Soil should not have more than 25% moisture.

Bagged bulk samples can be analyzed without preparation. The shape of the bag of contents should form a continuous uniform layer of at least 1 cm thickness.

Note: The sample should cover the source window or test guard window completely.

5.6 Calibration Procedures

The following procedures should be performed at the beginning of each day's analysis. In addition, one NITON standard should be analyzed after the instrument finishes self-calibration. The standard samples should also be analyzed once every 1-2 hours thereafter. Finally, at the end of the day, the self-calibration should be completed and the standard sample analyzed again.

5.6.1 Turn On Procedures

1. Depress and slide the On/Off switch on the bottom of the instrument. Each time the NITON is turned on, the Main menu will appear and the screen arrow will be pointed to Calibrate & Test.
2. Allow the NITON to warm-up for at least 15 minutes prior to testing.
3. Use the Setup Menu to check your instrument specification; to set the date and time; to illuminate the screen continuously; or to select a different testing mode. Once set up, the screen will remain the same each time you turn on the NITON until it is reset.
   - Select the Setup menu from the Main Menu with the arrow buttons.
   - Enter the Setup Menu by pressing Clear/Enter.
   - Use the arrow buttons to scroll to Set Time. Press Clear/Enter. The cursor will start at Month and move to the right each time you press Clear/Enter. The NITON will return to the Main Menu after the time and date have been changed.
   - Select Mode from the Setup Menu. Select the mode applicable to your testing (Bulk mode for soil testing). Press Clear/Enter.

5.6.2 Calibration

1. At the Main Menu, select Calibrate & Test. Press Clear/Enter to begin self-calibration. When the NITON beeps, self-calibration is complete. Self-calibration generally takes one to two minutes.
2. Test the Bulk Sample standard samples to check the calibration of the instrument.
   - Place the standard sample in the test platform receptacle.

- Push the safety slide (that locks the shutter release) out from under the shutter release. If the slide is still tucked in, you will not be able to press in the release and the instrument will not fit on the test platform correctly.
- Place the NITON on the test platform so that the standard sample in the receptacle is under the window of the NITON. (The test platform has a latch that is attached by screws underneath for storage. Before using the test platform, unscrew the latch and rescrew it on the end of the platform nearest the receptacle for the sample cup.) The back of the unit must be flush with the test platform. Squeeze the shutter release and firmly press the instrument flat against the surface of the test platform. If you don't squeeze the shutter release, the plunger will not depress. If the plunger is not fully depressed, the window is not fully open and the NITON cannot measure accurately. Ensure that the NITON is secure under the latch of the test platform.
- Follow the precision indicator or seconds timer on the NITON screen to see when the test has reached your desired level of detection and precision (approximately 120 seconds).
- Refer to Appendix J of the Operations Manual to compare the readings with the certified values for each of the metals in the standard.
- Caution: If you try to calibrate the instrument and it does not calibrate successfully, push the Reset button on the bottom of the instrument and recalibrate. If your NITON does not calibrate successfully in three attempts, please call the NITON Service Department at (401) 294-1234.

The XRF is ready to be used when calibration is complete.

5.7 Sample Preparations

5.7.1 In-situ Samples

- Clear the soil of all vegetation.
- Clear the soil of any debris that may interfere with readings or puncture the aperture window.
- Tamp the soil to ensure it is flat and free of voids.

5.7.2 Collected Samples

- Dry the samples in an oven or microwave oven.
- Grind the samples into a find powder, removing any large rocks or debris.
- Homogenize the sample to ensure consistency.
- Place the soil into an XRF soil cup, cover with film and seal.

5.8 Analytical Samples

5.8.1 Turn On Procedures

1. Depress and slide the On/Off switch on the bottom of the instrument. Each time the NITON is turned on, the Main menu will appear and the screen arrow will be pointed to Calibrate & Test.
4. Allow the NITON to warm-up for at least 15 minutes prior to testing.
5. Use the Setup Menu to check your instrument specification; to set the date and time; to

illuminate the screen continuously; or to select a different testing mode. Once set up, the screen will remain the same each time you turn on the NITON until it is reset.

- Select the Setup menu from the Main Menu with the arrow buttons.
- Enter the Setup Menu by pressing Clear/Enter.
- Use the arrow buttons to scroll to Set Time. Press Clear/Enter. The cursor will start at Month and move to the right each time you press Clear/Enter. The NITON will return to the Main Menu after the time and date have been changed.
- Select Mode from the Setup Menu. Select the mode applicable to your testing (Bulk mode for soil testing). Press Clear/Enter.
- Perform the self-calibration and standard sample calibration prior to testing as described above.

5.8.2 Field Use

1. Place the test guard on the ground.
2. Push the safety slide (that locks the shutter release) out from under the shutter release. If the slide is still tucked in, you will not be able to press in the release and the instrument will not fit on the test guard correctly.
3. Place the NITON on the test guard so that the rectangular opening on the test guard is under the window of the NITON. The back of the unit must be flush with the test guard. Squeeze the shutter release and firmly press the instrument flat against the surface of the test guard. If you don't squeeze the shutter release, the plunger will not depress. If the plunger is not fully depressed, the window is not fully open and the NITON cannot measure accurately. Note: You do not need to squeeze the shutter release continuously while taking a measurement. Hold the NITON firmly against the test guard surface and it will continue to read. Once you lift the instrument, the plunger will back out of the bottom, the shutter will close, and the test will be finished.
4. Follow the precision indicator or seconds timer on the NITON screen to see when the test has reached your desired level of detection and precision (approximately 60 seconds).
5. Release the shutter release mechanism when the test is complete.

5.9 Data Download and Erase Procedures

Your NITON can store data on up to 1,000 measurements in the Bulk Sample mode. You can download this date to a computer to print reports or to insert data into a database. Downloading the data, however, does not erase the readings. To make room for the next set of data, the readings must be erased after verifying that the data was successfully downloaded.

5.9.1 Fast Data Dump Download

1. You can download up to 3,000 measurements, their descriptions, and complete x-ray spectra (4-90 keV) in a few minutes, using NITON XTRA Software provided with your instrument. Open the XTRAS Program on your computer and open a file.
2. Connect your NITON to your computer with the standard RS-232 port cable that is provided.
3. From the Main Menu, use the arrow buttons, select Download Data and press Clear/Enter.

4. From the Download Data menu, select Fast Data Dump and press Clear/Enter. Select the first to last readings you wish to download. If you do not specify first and last readings, the default setting will download all readings currently stored in memory.
5. When the instrument finishes downloading, it will return to the Main Menu.

5.9.2 Data Erase

1. If you do not erase your data the NITON will continue to record data until the memory is full. The NITON will then start to overwrite older data. Any data that is overwritten this way will be lost.
2. From the Download Data menu, use the arrow buttons to scroll to Erase Readings. Press Clear/Enter.
3. The Erase Readings screen will appear with the following choices:

   ERASE all readings
   CANCEL do not erase
   EXIT to Main Menu

   The screen arrow defaults on CANCEL do not erase, so that if you select it by mistake, you will not erase any readings.
4. To erase readings, use the up-arrow button to go to ERASE all readings. Press Clear/Enter. Press YES when the prompt asks "Are you sure?" and press Enter.
5. When you enter either ERASE all readings or CANCEL do not erase, your instrument will return to the Main Menu, ready to take and store more readings.

For further information, please refer to the XTRAS manual that was included with your NITON.

5.10 Data Deliverables

The following documents are available to the client upon request:

1. A summary of initial, ongoing and end-of-analysis calibration results.
2. A log book detailing the following:
   - Weather conditions
   - Sampler(s)
   - Data of analysis
   - Time of each analysis
   - Location of each analysis
   - Sample preparations required
   - Results of each analysis
   - Any problems encountered and corrective actions taken
   - List date of XRF purchase, latest calibration, leak test, and source replacement
   - A printout of all results saved on the XRF and downloaded to a PC. This will be downloaded and formatted in Excel and will include sample number, date taken and value in ppm.
   - A summary of all QC required. This will be determined on a site-specific basis.

5.11 Quality Control Measures

The quality control requirements for the use of the NITON are determined on a site-specific basis. These are to be addressed in the site work plan and quality control plan. The exact requirements will vary depending on the use of the NITON on the site. However, all plans should require instrument calibration prior to and after NITON usage.

5.12 References

- NITON 700 Series User's Guide Version 5.2
  NITON Corporation
  1998
- Quality Assurance Technical Information Bulletin
  US Environmental Protection Agency
  Vol. 1, No. 4
  May 1991

APPENDIX C

QUALITY ASSURANCE PROJECT PLAN

KEYSTONE STEEL & WIRE COMPANY
PEORIA, ILLINOIS

A.1 TITLE AND APPROVAL SHEET

QUALITY ASSURANCE PROJECT PLAN

KEYSTONE STEEL & WIRE COMPANY

PEORIA, ILLINOIS

April 14, 2006

Approved By:

_____ _____

Jenny Elste
ENTACT Regulatory/Technical Officer

Date

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A.3 DISTRIBUTION LIST

The following individuals and their organizations will receive a copy of the approved Quality Assurance Project Plan (QAPP) and any subsequent revisions. Distribution will be made via paper copies or electronic media if equivalent information can be electronically submitted.

Name	Title	Company
Jonathon Adenuga	Project Manager	U.S. EPA Region 5
Russ Perry	Project Manager	Keystone Steel & Wire Company
Kevin Lombardozzi	Project Coordinator	On behalf of Keystone
Chad Erdmann	Project Coordinator	Keystone Steel & Wire Company
Greg Dambold	Project Coordinator	ENTACT Services LLC
Jenny Elste	Regulatory/Technical Officer	ENTACT Services LLC
Brent Hays	Field Project Manager	ENTACT Services LLC
Aaron McCorvey	On-site QA/QC Officer	ENTACT Services LLC
Lisa Grant	Project Manager	PDC Laboratories, Inc.
Andrew Tennyson	Project Manager	Pace Analytical Services

A.4 PROJECT / TASK ORGANIZATION

The Corrective Measures Management Team will consist of the following components and personnel, as described below and as shown on the Project Organization Chart included as Figure 1. ENTACT Services' LLC assigned management team may change during the implementation of the corrective measures; however, if there is a change in personnel, the modification will be communicated to the U.S. Project Manager.

A.4.1 Project Management

A.4.1.1 U.S. EPA Project Manager

The U.S. EPA Project Manager is Mr. Jonathon Adenuga. The U.S. EPA Project Manager will have oversight responsibility for all phases of the corrective measures. The U.S. EPA Project Manager will also be responsible for the review and approval of all submittals regarding the project.

A.4.1.2 Keystone Project Manager

The Project Manager for Keystone is Mr. Russ Perry. Mr. Kevin Lombardozzi and Mr. Chad Erdmann will be assisting Mr. Perry, on behalf of Keystone, as necessary. The Keystone Project Manager will report directly to the U.S. EPA Project Manager and will be responsible for providing status reports of the progress of the corrective measures, updating the project implementation schedule and resolving regulatory issues with the U.S. EPA.

A.4.1.3 Corrective Measures Contractor

The Corrective Measures Contractor is ENTACT Services LLC (ENTACT). The Corrective Measures Contractor will be responsible for the construction and implementation of the corrective measures in accordance with the *Corrective Measures Implementation (CMI) Workplan* dated November 4, 2005. The following ENTACT personnel will be assigned to perform the key duties described below.

A.4.1.3.1 ENTACT Project Coordinator

The ENTACT Project Coordinator is Mr. Greg Dambold. The ENTACT Project Coordinator will work with the Keystone Project Manager and the U.S. EPA to ensure that all testing programs, corrective measures plans and quality assurance procedures that are proposed for the project are in compliance with applicable federal and state regulations. The responsibilities of the Project Coordinator will also include providing Keystone and U.S. EPA with the required information.

A.4.1.3.2 ENTACT Corporate Health and Safety Director

The ENTACT Corporate Health and Safety Director is Mr. Don Self. The Corporate Health and Safety Director will be responsible for writing and reviewing the *HASP* and overseeing ENTACT's Health and Safety Program, including the maintenance of personnel files. He will provide direction to the ENTACT Field Project Manager and/or On-site Health and Safety Officer, as necessary, on issues of health and safety. The Corporate Health and Safety Director will be responsible for conducting the Health and Safety Orientation Meeting prior to the start of construction activities, reviewing weekly health and safety updates and conducting health and safety inspections of the site during the corrective measures.

A.4.1.3.3 ENTACT Regulatory/Technical Officer

The ENTACT Regulatory/Technical Officer is Ms. Jenny Elste. The ENTACT Regulatory/Technical Officer will be responsible for ensuring that all work performed is in full compliance with all applicable federal, state and local regulations and that the defined remedial goals for the project are effectively met. In addition, the ENTACT Regulatory/Technical Officer will be responsible for providing technical direction and support to field operations, ensuring that all necessary quality assurance/quality control measures are implemented during the corrective measures and all data received from the analytical laboratory is reviewed and validated.

A.4.1.3.4 ENTACT Project Engineer

The ENTACT Project Engineer is Mr. Chris Preston, P.E. The Project Engineer will provide technical support to the Field Project Manager in the areas of engineering design, backfill placement and any other design requirements associated with the corrective measures. Specific responsibilities will include, but are not limited to, the following:

- Provide technical support and direction for the implementation of the required corrective measures; and
- Provide assistance in the modification of technical requirements of the corrective measures, if different than technical requirements provided in the approved *CMI Workplan.*

A.4.2 Field Management

A.4.2.1 ENTACT Field Project Manager

The ENTACT Field Project Manager is Mr. Brent Hays. The Field Project Manager will be responsible for directing all site personnel, equipment, subcontractors, and activities to ensure the successful implementation of the corrective measures. Specific responsibilities of the Field Project Manager will include, but are not be limited to, the following:

- Supervising field activities and ensuring that the construction activities are executed in

accordance with the *CMI Workplan*;

- Ensuring that adequate resources are available on-site to complete required tasks and meet the required performance standards;
- Ensuring ENTACT associates and qualified subcontractors are properly trained in the safe performance of the tasks which they are assigned;
- Ensuring that required record-keeping and project record documents and other related documents are maintained on-site;
- Assisting others in the planning, coordination of field activities and implementation of the corrective measures activities;
- Communicating with the ENTACT Project Coordinator to remedy problems to ensure agreement on the tasks to be performed each day and to monitor compliance with the approved plans and applicable federal, state, and local regulations; and
- In response to modified or unforeseen field conditions, redirecting the sequence of required site work and specifics of work procedures and protocols to accomplish task objectives in the safest and most efficient manner possible.

A.4.2.2 On-Site Health and Safety Officer

The On-site Health and Safety Officer is Mr. Brent Hays. The On-site Health and Safety Officer will be responsible for the coordination of on-site health and safety issues with ENTACT's Corporate Health and Safety Director. Specific duties of the On-site Health and Safety Officer will include the following:

- Monitoring work at all times or designating a suitably qualified alternate;
- Ensuring that site workers have read and understand the *HASP*;
- Ensuring the site workers possess the required documentation of their safety training and medical monitoring;
- Conducting daily safety meetings and more extensive safety meetings at the start of new and/or potentially dangerous project activities;
- Ensuring that required air monitoring is being conducted in accordance with the approved *CMI Workplan* and *HASP*;
- Correcting or discontinuing any potentially unsafe work practices or site conditions, and, if necessary, stopping work activities if unsafe conditions or practices are encountered and not

corrected or discontinued;

- Preparing safety reports and other health and safety documentation; and
- Communicating any concerns or health and safety issues to the Field Project Manager and ENTACT's Corporate Health and Safety Director.

A.4.2.3 ENTACT On-site QA/QC Officer

The ENTACT On-site Quality Assurance/Quality Control (QA/QC) Officer is Mr. Aaron McCorvey. The On-site QA/QC Officer will be responsible for performing required quality control testing at the site. He will operate independently of ENTACT's Field Project Manager. The QA/QC Officer will communicate any QA/QC issues related to the site to the Regulatory/Technical Officer and the Field Project Manager. The QA/QC Officer will have the authority to correct and implement additional measures to assure compliance with the approved plans, including the QAPP. Specific responsibilities will include:

- Ensuring that required QA/QC procedures are properly implemented and documented;
- Ensuring adherence to the approved *Field Sampling Plan (FSP)* and QAPP;
- Coordinating the implementation of the *FSP* and QAPP with the Field Project Manager;
- Documenting any deviations to the *FSP* or QAPP with a justification for the deviations, and, if necessary, appropriate notification in accordance with the approved *CMI Workplan*;
- Securing necessary sampling tools, bottles, packaging/shipping supplies, chain-of custody documents, etc. in accordance with the approved *CMI Workplan*;
- Collecting or directing the collection of samples for laboratory analysis of the parameters specified in the *FSP* and QAPP;
- Documenting the location, time and date of all samples that are collected and shipped to the laboratory;
- Interfacing with the Superintendents such that the sample collection is coordinated with the general progression of work;
- Notifying the Field Project Manager and ENTACT Project Coordinator of any sampling activities associated with the implementation of the approved *CMI Workplan*;
- Obtaining analytical results, evaluating laboratory data and reporting the data to the Field Project Manager and ENTACT Project Coordinator; and

- Approving or disapproving of materials supplied to the site and procedures for installation and/or use of those materials.

A.4.2.4 ENTACT Field Technical Staff

The ENTACT Technical Staff for this project will be selected from our team of hazardous materials technicians. All of the designated team members are experienced professionals who possess the degree of technical competence required to effectively and efficiently perform the required work.

A.4.3 Laboratory Management

The laboratories that will be performing sample analysis for this project are PDC Laboratories, Inc. in Peoria, Illinois and Pace Analytical Services in Indianapolis, Indiana.

A.4.3.1 Laboratory Project Manager

The Project Manager for PDC Laboratories, Inc. is Ms. Lisa Grant. The Project Manager at Pace Analytical Services is Mr. Andrew Tennyson. The Laboratory Project Managers will report directly to ENTACT's QA/QC Officer and will be responsible for ensuring that all resources of the laboratory are available on an as required basis. The Laboratory Project Managers will also be responsible for the review of final laboratory reports.

A.4.3.2 Laboratory QA Officer

The Laboratory QA Officer for each laboratory will be appointed by the appropriate Laboratory Project Manager. The Laboratory QA Officer has the overall responsibility for data after testing and analysis is complete. The Laboratory QA Officer will communicate data issues through the Laboratory Project Manager. In addition, the Laboratory QA Officer will review laboratory QA/QC documentation, conduct detailed data reviews, determine whether to implement corrective action, and define appropriate laboratory procedures.

A.4.3.3 Laboratory Sample Custodian

The Laboratory Sample Custodian for each laboratory will be appointed by the appropriate Laboratory Project Manager. The Laboratory Sample Custodian's responsibilities will include the following: receiving, recording and inspecting incoming samples; verifying the accuracy of chain-of-custody records; notifying the Laboratory Project Manager of sample receipt and inspection details; assigning unique identification numbers to incoming samples; entering the unique identification numbers of each sample into the sample receiving log; and transferring samples to the appropriate lab section. The Laboratory Sample Custodian will report to the Laboratory Project Manager.

A.4.3.4 Laboratory Technical Staff

The Laboratory Technical Staff will be responsible for sample analysis and identification of corrective actions.

A.5 PROBLEM DEFINITION / BACKGROUND

This Quality Assurance Project Plan (QAPP) has been developed for the Keystone Steel & Wire Company manufacturing facility in Peoria, Illinois for use in conjunction with the *CMI Workplan*. The QAPP presents, in specific terms, the policies, organization, functions, and QA/QC requirements designed to achieve the data quality goals. This detailed QAPP has been prepared for use by personnel who perform environmental services to ensure the data are scientifically valid and defensible, and establishes the analytical protocols and documentation requirements to ensure the data are collected, reviewed, and analyzed in a consistent manner. This QAPP is considered required reading for all staff participating in the work effort and will be in the possession of the field teams and the laboratories performing the work. All contractors and subcontractors will be required to comply with the procedures documented in this QAPP in order to maintain comparability and representativeness of the data produced.

A.5.1 Site Location and Description

The Keystone Facility is an active facility located at 7000 SW Adams Street in Peoria County, Peoria, Illinois (see Figure 1 of the *CMI Workplan*). The facility encompasses approximately 1,000+ acres and is located in an industrial area of southwest Peoria adjacent to the west bank of the Illinois River.

Construction and operation of the Steel Works and Wire Mill at the facility began shortly after 1900 and has operated in the same industrial mode since that time. The plant began producing steel and wire products and later (in 1950s) added the Mid Mill complex to add industrial wire production capacity. Steel was produced in open hearth furnaces until 1969 when the transition to electric arc furnaces was initiated. The last open hearth furnace was decommissioned in the 1980s and Keystone now operates two electric arc furnaces (one melting furnace and one refining furnace). All of the areas where contaminated media exist are located within the confines of Keystone's industrial complex on land that is zoned for industrial use. Operation of the property has been industrial for over 100 years and its use is anticipated to be industrial for the foreseeable future.

A.5.2 Site History

An Administrative Order on Consent (AOC) was established as part of U.S. EPA's implementation of the Environmental Indicators (EI) program under the Government Performance and Results Act (GPRA), as a follow-up to the original RCRA Facility Assessment (RFA) performed at Keystone in 1987. The 1989 RFA Report identified several areas of potential concern, and five of these areas were targeted for further investigation during a U.S. EPA site visit conducted in November 1999. Those five units were specifically listed in the AOC. In late summer 2001, Keystone procured new samples and analytical data at the five units identified as the Sheen Pond, F-Pond, Tail Tracks Landfill, East Pond, and Oil Skimmer Basin. The results of these investigations are described in the *Sampling Report for Environmental Indicators Assessment Investigation* submitted to U.S. EPA Region 5 on January 29, 2002. As presented

in the original January 2003 *Final Corrective Measures Proposal*, corrective action is only being required at the F-Pond.

On January 29, 2002, Keystone submitted its *Environmental Indicators Assessment Report* to U.S. EPA Region 5. This report documented Keystone's draft determination that current human exposures to contaminated soil and migration of contaminated groundwater are under control at the facility. U.S. EPA approved this determination, but also requested that Keystone perform additional sampling to confirm whether corrective measures could be necessary in some of the other areas listed in the 1989 RFA, but not included in the 2000 AOC. To address these concerns, Keystone collected additional samples at the North Ditch Staging Area, Slag Processing Area, East Waste Pond, and East Sludge Pond in fall 2002. In the fall of 2003, follow-up samples were collected in the East Waste Pond, and new samples were also collected from the North and South Sludge Lagoons.

Following its review of the new data, U.S. EPA requested that Keystone prepare a revised final corrective measures proposal to summarize the actions to be taken to protect human health and the environment from all current and future unacceptable risks that potentially could result from contaminated soil, sediment and groundwater at the facility. The Revised Final Corrective Measures Proposal for the F-Pond and North Ditch Staging Area was submitted to U.S. EPA Region 5 on February 14, 2005. Revision 1.0 to the Revised Final Corrective Measures Proposal which addressed U.S. EPA's comments and concerns was then submitted on April 12, 2005.

On October 14, 2005, U.S. EPA issued the Statement of Basis for the project which describes U.S. EPA's selected corrective measures for the F-Pond and North Ditch Staging Area. The *CMI Workplan* was developed to describe the procedures to be implemented to conduct these activities.

For reference, the areas and units discussed in this Plan are depicted on a layout map of the Keystone facility (see Figure 2 of the *CMI Workplan*).

A.5.3 Summary of Corrective Measures Activities

The selected corrective measures for the F-Pond and North Ditch Staging Area address lead and iron contamination, as appropriate, in the sediment/soil. The major components of the selected corrective measures, as presented in the Statement of Basis, include the following:

F-Pond

- Dewatering of the F-Pond;
- Identification of characteristically hazardous soils/sediments;
- In-situ treatment of characteristically hazardous soils/sediments, if present, to render the soils/sediments non-hazardous, when generated;

- Excavation of the treated and impacted soils/sediments to achieve the remediation goals;
- Off-site disposal of the excavated soils/sediments as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the F-Pond to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

North Ditch Staging Area

- Identification of characteristically hazardous soils;
- In-situ treatment of characteristically hazardous soils, if present, to render the soils non-hazardous, when generated;
- Excavation of the treated and impacted soils to achieve the remediation goals;
- Off-site disposal of the excavated and treated soils as non-hazardous waste at a Subtitle D disposal facility;
- Deed restriction on the North Ditch Staging Area to limit future use of the unit to commercial/industrial purposes; and
- Implementation of a groundwater monitoring system to demonstrate no impact to the underlying groundwater.

The selected corrective measures were designed to reduce or eliminate the potential for direct contact, ingestion or inhalation of impacted soils and sediments with lead and/or iron concentrations which exceed the remediation goals in the F-Pond and North Ditch Staging Area. In order to meet this objective, remediation goals for lead and iron were established. These goals are as follows:

F-Pond

- Lead: 800 mg/kg, and
- Iron: 100,000 mg/kg.

North Ditch Staging Area

- Lead: 800 mg/kg.

The corrective measures activities are described in detail in the *CMI Workplan.*

A.6 PROJECT / TASK DESCRIPTION

The major activities described in Section A.5 will be conducted during the corrective measures to complete closure of the units in accordance with the requirements of the Consent Order. The scope of this QAPP includes the QA/QC requirements for the sampling and analysis of materials associated with these major activities. The sampling and analysis activities will include the following:

- Characterization of surface water in the F-Pond, if present;
- Characterization of the in-place soil/sediment to determine if the material exhibits the toxicity characteristic for lead;
- Characterization of the in-place soil/sediment to determine the extent of total lead and iron contamination;
- Characterization of the in-place, in-situ treated soil/sediment to confirm that the material no longer exhibits the toxicity characteristic for lead and will not be considered a hazardous waste;
- Confirmation of in-place soils for excavation confirmation purposes;
- Characterization of backfill and topsoil materials for determining potential use; and
- Characterization of groundwater.

A.6.1 Measurements to be Performed

The measurements that will be performed during the corrective measures reflect the requirements of each task and address the specific project objectives. A summary of the analytical parameters by task is presented on Table 1, with more detailed information provided in the *FSP*. Quality assurance objectives are presented on Table 2.

A.6.1.1 Surface Water

Surface water in the F-Pond, if present, will be sampled to determine the nature and concentration of the contaminants of concern for discharge purposes. Specifically, the contaminants of concern identified during the previous investigations, i.e. lead, iron, manganese, and trichloroethylene (TCE), will be analyzed for. A grab sample will be collected from the surface water and submitted to an analytical laboratory for analysis of total lead, iron, manganese, and trichloroethylene. The sampling and analysis procedures are further described in the *FSP*.

A.6.1.2 Sediment/Soil

Characterization samples will be collected from the F-Pond and North Ditch Staging Area to determine if the sediment/soil exhibits the toxicity characteristic for lead and from the F-Pond to determine if the sediment/soil requires excavation based on the total lead and iron concentrations. Five-point composite samples will be collected from the F-Pond and grab samples will be collected from the North Ditch Staging Area for submittal to an analytical laboratory for analysis of TCLP lead and/or total lead and iron. Four-point composite samples will also be collected from each 300 cubic yard volume of treated sediment/soil in the in-situ treatment areas for characterization purposes. The sampling and analysis procedures are further described in the *FSP*.

A.6.1.3 Excavated Sediment/Soil Surface

The sediment/soil surface in each excavated grid of each unit will be sampled to confirm that the applicable remediation goals have been achieved. The remediation goals for these units are as follows: 800 mg/kg total lead for the North Ditch Staging Area and 800 mg/kg total lead and 100,000 total iron for the F-Pond.

Samples will be collected from a depth of 0 to 6 inches below ground surface (bgs) from the post-excavation surface of each grid bottom and sidewall as depicted on Figures 1 and 2 of the *FSP*. The samples will be submitted to an analytical laboratory for analysis of total lead and iron for the F-Pond and total lead for the North Ditch Staging Area. Post-excavation confirmation samples will also be collected from the post-excavation bottom of those areas where sediment/soil TCLP lead concentrations exceeded 5 ppm. The sampling and analysis procedures are further described in the *FSP*.

A.6.1.4 Backfill and Topsoil Material

Any fill material obtained from a borrow source whether located on-site or off-site will be sampled prior to use to verify the presence or absence of hazardous constituents. A representative sample consisting of at least 4 parts obtained directly from the source area, stockpiled material from the source area or from a clean container of at least 10 pounds of material will be collected for each source. The sample will be submitted to an analytical laboratory for analysis of total RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) by U.S. EPA Method 6010B and 7471A and total petroleum hydrocarbons (TPH) by 8015. The total RCRA 8 metals results will be compared to the Illinois TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties and the TPH concentration will not exceed 100 ppm. If the TPH concentration exceeds 100 ppm, then the sample will be analyzed for SVOCs and the results will be compared to the Illinois TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties. If the results are less than the applicable TACO Tier I Soil Remediation Objectives for Industrial/Commercial Properties, then the backfill source will be deemed clean for use. The sampling and analysis procedures are further described in the *FSP*.

A.6.1.5 Groundwater

Groundwater samples will be collected on a quarterly basis for a period of one year from three monitoring wells associated with the F-Pond and four monitoring wells associated with the North Ditch Staging Area. The samples will be submitted to a laboratory for analysis of total lead to demonstrate no impact to groundwater. The groundwater sampling procedures are further described in the *FSP*.

A.6.1.6 General Office Trash and Refuse

There will be a limited amount of office trash, refuse and sewage generated during the corrective measures. Examples of such items include trash from the project trailers (paper cups, paper towels, sheets of paper, trash bags, and food containers) as well as sewage from toilets and sinks. The trash will be disposed as non-hazardous municipal solid waste at a permitted municipal waste landfill. The sewage will be collected by a registered hauler and disposed at a permitted sewage collection or disposal facility. There are no sampling requirements associated with these waste streams.

A.6.2 Project Schedule

The corrective measures described in the *CMI Workplan* will require approximately 4 months to complete. The work schedule will be based on a 5-6 day, 55-65 hour workweek. The sequencing of work activities may be modified in the field depending on site conditions, work procedures, health and safety protocols, weather, and similar factors. The proposed project schedule is included as Figure 4 to the *CMI Workplan*.

A.7 DATA QUALITY OBJECTIVES AND CRITERIA

The overall QA objective for this project is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are representative of site conditions. The purpose of implementing these procedures is to assess the data generated for accuracy, precision, representativeness, completeness, and comparability for both the laboratory analytical program and field sample collection activities. The primary goal of the program is to ensure that the data generated are representative of environmental conditions at the site. To obtain this goal, a combination of statistical procedures and qualitative evaluations will be used to check the quality of the data. The Data Quality Indicators (DQIs) of precision, accuracy, representativeness, completeness, and comparability (PARCC) will be computed in the manner described in the following paragraphs. A qualitative assessment of PARCC factors will be made and will be documented. Specific procedures for sampling, chain-of-custody, laboratory instrument calibration, laboratory analysis, reporting of data, internal quality control, audits, preventative maintenance of field equipment, and corrective action are described in other sections of this QAPP.

A.7.1 Precision

The precision of laboratory results and field sampling efforts will be evaluated by examining laboratory and field QC sample results. Analytical precision will be evaluated for analytical methods by comparing the QC criteria stipulated in the standard operating procedures to the results from laboratory matrix spike/matrix spike duplicate samples and field duplicate samples.

A.7.1.1 Definition

Precision is a measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions, usually expressed in terms of the standard deviation.

A.7.1.2 Field Precision Objectives

Field precision is assessed through the collection and measurement of field duplicates at a rate of 1 duplicate per 10 analytical samples, matrix independent. No field duplicates for TCLP samples will be required.

A.7.1.3 Laboratory Precision Objectives

Precision in the laboratory is assessed through the calculation of relative percent difference (RPD) and relative standard deviations (RSD) for replicate samples. The equations to be used for precision in this project can be found in Section D.3 of this QAPP. Precision control limits are provided in Table 2.

A.7.2 Accuracy

The accuracy of the analytical data will be assessed by examining the results obtained from the analysis of sample blanks, duplicate samples, laboratory matrix spike/matrix spike duplicate samples, and method required laboratory QA/QC samples. One equipment rinsate blank will be prepared and documented for every day of sampling using non-dedicated, non-disposable sampling equipment. One matrix spike and 1 matrix spike duplicate will be analyzed for every 20 samples. Data will be qualified in accordance with the appropriate U.S. EPA functional guidelines for evaluating data if either field QC blanks or laboratory QC blanks indicate that the accuracy or precision of analytical results is compromised.

A.7.2.1 Definition

Accuracy is the degree of agreement of a measurement with an accepted reference or true value.

A.7.2.2 Field Accuracy Objectives

Accuracy in the field is assessed through the use of field rinsate blanks and adherence to all sample handling, preservation, and holding times.

A.7.2.3 Laboratory Accuracy Objectives

Laboratory accuracy is assessed through the analysis of matrix spikes (MS) or standard reference materials (SRM) and the determination of percent recoveries. The equation to be used for accuracy in this project can be found in Section D.3 of this QAPP. Accuracy control limits are provided in Table 2.

A.7.3 Completeness

A.7.3.1 Definition

Completeness is the amount of valid data obtained from a measurement system compared to the amount that was expected and needed to be obtained to meet the project data goals.

A.7.3.2 Field Completeness Objectives

Field completeness is the measurement of the amount of valid measurements obtained from all the measurements taken in the project. The intent of this program is to attempt to achieve a goal of 100 percent completeness. Realizing that under normal conditions this goal may not be achievable, the completeness goal for this program is 90 percent. This completeness goal is considered adequate to meet the data quality objectives for this site based on prior consideration of PARCC parameters, the sampling design plans, and data collection activities proposed for each medium. In developing the sampling design plan, critical data points were carefully considered and identified to help ensure comparability of data. The equation for completeness is presented in Section D.3 of this QAPP.

A.7.3.3 Laboratory Completeness Objectives

Laboratory completeness is a measure of the amount of valid measurements obtained from all the measurements taken in the project. The intent of this program is to attempt to achieve a goal of 100 percent completeness. Realizing that under normal conditions this goal may not be achievable, the completeness goal for this program is 90 percent. The laboratory equation for completeness is presented in Section D.3 of this QAPP.

A.7.4 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent environmental conditions and parameter variations at a sampling location. Representativeness is a qualitative parameter most concerned with the proper design of the sampling program. The representativeness criterion is best satisfied by assuring that sampling locations are properly selected and a sufficient number of samples are collected.

A.7.4.1 Definition

Representativeness is the selection of analytical methods and sampling protocols and locations such that results are representative of the media being sampled and conditions being measured.

A.7.4.2 Measures to Ensure Representativeness of Field Data

Representativeness is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the *FSP* is followed and that proper sampling techniques are used.

A.7.4.3 Measures to Ensure Representativeness of Laboratory Data

Representativeness in the laboratory is ensured by using the proper analytical procedures, meeting sample-holding times, and analyzing and assessing field duplicate samples. The sampling network was designed to provide data representative of facility conditions. During the development of this network, consideration was given to past waste disposal practices, existing analytical data, physical setting, and constraints inherent to the *CMI Workplan*. The rationale of the sampling network is discussed in the *FSP* and Section B.1 of this QAPP.

A.7.5 Comparability

Comparability of the data collection activities must consider field conditions as well as sampling and analytical techniques. Comparability cannot be ensured through use of standard methods and protocols alone. In order to compare data, various important elements will be considered. During this project, 3 elements will be evaluated for data comparability. These 3 elements include analytical methods, quality of data, and sampling design. If after the initial evaluation, data do not appear comparable, the ENTACT

QA/QC Officer will attempt to identify other components possibly affecting comparability, including but not limited to field conditions, sampling protocols, and the occurrence of true data anomalies.

A.7.5.1 Definition

Comparability is an expression of the confidence with which one data set can be compared to another.

A.7.5.2 Measures to Ensure Comparability of Field Data

Comparability is dependent upon the proper design of the sampling program and will be satisfied by ensuring that the *FSP* is followed and that proper sampling techniques are used.

A.7.5.3 Measures to Ensure Comparability of Laboratory Data

Planned analytical data will be comparable when similar sampling and analytical methods are used and documented. Similar QA objectives will be used throughout the project to ensure comparability.

A.7.6 Level of Quality Control Effort

Field rinsate blank, duplicate and matrix spike samples will be analyzed to assess the quality of data resulting from the field sampling and analytical programs. Field rinsate blanks, consisting of distilled water used to rinse decontaminated non-disposable sampling equipment, will be submitted to the analytical laboratory to provide a means to assess the quality of the data resulting from the field sampling program, and to check for procedural contamination at the facility which may cause sample contamination. Field rinsate blanks will be collected at a frequency of 1 per each day of sampling using non-dedicated, non-disposable sampling equipment.

Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures. Duplicate samples are analyzed to check for sampling and analytical reproducibility. Matrix spikes provide information about the effect of the sample matrix on the digestion and measurement methodology. All matrix spikes are performed in duplicate and are referred to as MS/MSD samples. One MS/MSD will be analyzed for every 20 or fewer samples per sample matrix. The MS/MSD may or may not be from the same batch as the site samples. The general level of the QC effort will be 1 field duplicate for every 10 or fewer samples (excluding TCLP samples).

A.8 SPECIAL TRAINING / CERTIFICATION

Special training and certifications are required for personnel working at the site. The following subsections further describe these requirements.

A.8.1 ENTACT Personnel

ENTACT personnel are required to obtain Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Operations (HAZWOPER) training in accordance with 29 CFR §1910.120 and annual 8-hour refresher training in order to work on-site. The ENTACT Corporate Health and Safety Director is responsible for conducting the HAZWOPER training.

Personnel operating the x-ray fluorescence (XRF) field screening unit are required to obtain 8 hours of radiation safety training. This training is presented by the manufacturer of the XRF field screening unit.

Personnel responsible for carrying out the requirements of the *Spill Prevention, Control and Countermeasures Plan* receive additional training in the prevention of the discharge of oil or oil products, as required by 40 CFR §112.7.

Daily health and safety meetings are conducted at the site prior to the start of each workday. The On-site Health and Safety Officer is responsible for identifying the topics of discussion, which may include spill response, housekeeping, equipment safety, equipment inspections, personnel training, and other various health and safety-related topics.

The training records for ENTACT employees are maintained by ENTACT's Corporate Health and Safety Director, as required. Training certifications, medical monitoring information, and any other pertinent information is maintained in the ENTACT Corporate Office in Grapevine, Texas.

A.8.2 Subcontractors

Subcontractors performing work at the site will be required to obtain OSHA 40-hour HAZWOPER training and the necessary 8-hour annual refresher training.

All subcontractors will be required to adhere to all aspects of the *HASP* during the remedial work.

Training records for subcontractors will be maintained by the individual subcontractor. However, the records will be available for ENTACT's review.

A.9 DOCUMENTS AND RECORDS

Maintenance of the project documents will be the responsibility of the Field Project Manager and the field personnel whose defined tasks include document and record maintenance. The appropriate field personnel will be required to inform the Field Project Manager of any necessary revisions to the project documents. This will ensure that revised documents are properly maintained and distributed.

A.9.1 Field Records

Field documents will be carefully prepared to maintain sample identification and control sample disposition. Components of the field documentation procedures will include the use of field logbooks and chain-of-custody forms. Original data recorded in field logbooks, chain-of-custody records and other forms will be written in waterproof ink.

A.9.1.1 Field Logbooks

Field logbooks will provide the documentary evidence for sampling procedures as performed by field personnel. Each entry should be legible and contain accurate and complete field documentation of specific activities. The logbook should contain only facts and observations. Each logbook page should be numbered, dated, and signed by all personnel making entries on that page. Under no circumstances will pages be removed from the logbook. General information that will be documented in the field logbook(s) includes, but is not limited to, the following:

- The objective(s) of the days' activities;
- Identification of sampling teams, major equipment used, procedures followed, and weather conditions;
- Notation of time and chronological summary of field activities and events; and
- Signatures of individuals making entries.

Specific information that should be documented in the field logbook includes, but is not limited to:

- Sampling data, sample locations, references, and labeling described for specific activities for sampling and chain-of-custody procedures;
- Results of measurements and calibration of field instruments used; and
- Detailed descriptions of health and safety related activities at the Site.

ENTACT has devised specific field logbooks for specific tasks, which include self-prompting headings for appropriate information. Separate logbooks will be maintained for the following:

- Overall, daily project activities;
- Records of site visitors;
- Air sampling for worker health and safety; and
- Waste and media samples.

ENTACT's Field Project Manager and QA/QC Officer will ensure that the field logbooks are completed and maintained on-site at the field officer trailer. The QA/QC Officer will be responsible for ensuring that the correct documentation (i.e., logbooks, chain-of-custody documentation, etc.) is prepared for each task(s) performed on a given day.

A.9.1.2 Chain-of-Custody Forms

A chain-of-custody (COC) form will be completed to record the custody of every sample collected. A COC form will accompany every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from the time of sample collection through sample analysis. An example COC form is presented in Attachment C-1.

The sample portion of the COC form will include the following information: project number, name and location; sample identification; name of Project Manager, Sampler, and Recorder; sampling information (sampling area, depth, media type, type of sample, date and time of collection, etc.); analysis to be performed; preservatives used, if any; special directions; and signatures of persons involved in the COC possession, including dates.

When a COC form is filled out, 1 page of the 3-part form is retained and placed in a file at the on-site office. The other 2 parts of the form accompany the sample to the laboratory and 1 of the pages is retained by the laboratory and the other is returned with the sample result report. When the sample report is received, it is cross-checked with the COC file record and both COC pages and the laboratory report are placed in a file in fireproof storage at the on-site office. The analytical result is also entered into a computer database consisting of a comprehensive list of all samples taken at the site and the analytical results.

A.9.1.3 Equipment Calibration Documents

Logs will be used to record calibration, maintenance and service procedures and schedules. All calibration and maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Any items found to be inoperable will be taken out of use and a note stating the time and date of this action will be made in the calibration sheets and logs. The reason for

equipment failure and the time and date of its return to service will also be noted in the logbook. Records produced will be reviewed, maintained, and filed by the operators at the laboratories and by the data and sample control personnel when and if equipment, instruments, tools, and gauges are used at the site.

A.9.2 Laboratory Records

Records of laboratory analysis will be provided to ENTACT in hard copy format. The laboratory reports will be maintained in a 3-ring binder at the field office trailer during the implementation of the corrective measures. A data summary will be developed in Microsoft Excel spreadsheet format to facilitate data review, data sorting and statistical analysis. Upon the completion of the corrective measures, the laboratory records will be transferred to ENTACT's Corporate Office in Grapevine, Texas. The laboratory records will be maintained by ENTACT for a period of 10 years.

A.9.3 Transportation and Disposal Records

The appropriate documentation will be generated and maintained for all material transported from the site to an off-site disposal facility. A waste manifest will be provided with each loaded transport vehicle. The documentation will identify the generator, transporter and disposal facility name and corresponding U.S. EPA identification number, the nature of the material, the date the material was transported from the site, and the estimated weight or volume of material. The documentation will be signed by an ENTACT representative, as an agent for the owner, and the transport vehicle driver before the material is transported from the site. A copy of the manifest will be retained by the ENTACT representative for documentation purposes.

Upon receipt of the material, the disposal facility will be required to sign the waste manifest. A copy of the signed waste manifest will be returned to ENTACT for record-keeping purposes. The completed manifests will be filed and stored in the ENTACT field project office for the duration of the removal activities.

Weight tickets will be obtained from the disposal facility to verify the quantity of material transported from the site with each load. ENTACT will maintain a spreadsheet at the field office to track the quantities of generated waste materials requiring off-site disposal.

A.9.4 Project Records

A.9.4.1 Weekly and Quarterly Reports

Weekly status reports will be prepared by ENTACT to document the activities performed at the site during the previous week. The weekly status reports will include a description of all work in progress, a summary of the status of each work activity, a description of any new work started, and the location of the work being performed. The weekly status report will also include the project name, project number, date,

and summary of the week's weather conditions. Each weekly report will be submitted to Keystone for review.

Quarterly progress reports will be prepared and forwarded to U.S. EPA to describe the actions that have been taken place, as part of the CMI activities, during the subject quarter; summarize all sample analytical results and all other data received or generated during the CMI activities of the quarter; identify all documents completed and submitted as part of the CMI activities during the subject quarter; describe all CMI actions which are scheduled for the next quarter and information regarding the construction progress; identify problems encountered and resolutions implemented as part of the CMI activities during the subject quarter; and summarize any CMI Workplan modifications proposed or approved. The Keystone Project Manager will be responsible for providing the quarterly progress reports to the U.S. EPA. The U.S. EPA will be notified of any change in the schedule described in the quarterly progress report for the performance of any activity no later than 7 days prior to performance of this activity.

A.9.4.2 Corrective Measures Implementation Report

Within 60 days following demobilization, ENTACT will submit a written report to the U.S. EPA, which documents the completion of the corrective measures at the F-Pond and North Ditch Staging Area. The *Corrective Measures Implementation Report* will include, at a minimum, the following:

- Summary of the objectives of the corrective measures;
- Summary of the site location, description and history;
- Summary of the corrective measures activities conducted at the F-Pond and North Ditch Staging Area, including waste handling and disposal activities, sampling and analysis activities and quality assurance/quality control;
- Scaled drawings of the units showing the horizontal and vertical boundaries of the extent of soil removal and the locations of sample collection;
- Copies of waste manifests and laboratory analytical reports;
- Chronological summary of the corrective measures;
- Tabulated analytical results for air, soil, waste, and groundwater and the volume of waste shipped off-site for disposal;
- Photographs of the progress of the corrective measures; and
- Documentation of the implementation of institutional controls.

A.9.4.3 Project Schedule Records

The progress of work will be depicted in the project schedule. The project schedule will be updated on a monthly basis, at a minimum, to reflect the progress of the corrective measures.

A.9.5 Photographic Documentation

Photographs will be taken in order to serve as a pictorial record of work progress, problems encountered and mitigation activities. ENTACT's file at the site will contain color prints, labeled with the date and subject of the photograph. Negatives will also be stored in a separate file in chronological order. Digital photos will be stored on the project computer or on CD. Photographic reporting data sheets, where used, will be cross-referenced with observation and testing data sheets and/or construction problem and solution data sheets. Photographic documentation will also be included in the *Corrective Measures Implementation Report.*

A.9.6 Document Storage, Long-Term Maintenance, and Electronic Storage

Documents and records associated with the corrective measures will be stored on-site in the field office trailer during the implementation of the corrective measures. Upon the completion of the corrective measures, the documents and records will be transferred to ENTACT's Corporate Office in Grapevine, Texas for long-term storage. Electronic documents will be transferred to CD and filed with the paper documents. All documents and records associated with the site will be maintained by ENTACT for a period of 10 years.

B.1 SAMPLE PROCESS DESIGN

Sampling data will be collected during the corrective measures for the purposes of characterizing the sediment/soil to determine if it exhibits the hazardous toxicity characteristic for lead, for confirming the remediation goals in the post-excavation soil surface, for verifying the TCLP concentrations of the constituents of concern in the in-situ treated sediment/soil for off-site disposal purposes, for determining the use of backfill and topsoil materials, and for determining no impact to groundwater. The sampling design will ensure data of sufficient quantity and quality are obtained in order to make the appropriate determinations.

B.1.1 Sample Frequency

The frequency of sampling will be sufficient to make the appropriate determination. The *FSP* describes the sampling frequencies associated with each sample category.

B.1.2 Sample Type

Two types of samples will be collected during the corrective measures: grab samples and composite samples. A grab sample is defined as an individual sample collected from a single location at a specific time. A composite sample is defined as a sample collected over a temporal or spatial range that typically consists of discrete, equal samples (or aliquots) which are combined or composited. The type of sample collected will be dependent on the sample category. The *FSP* describes the sample types associated with each sample category.

B.1.3 Sample Matrix

The sample matrix will be dependent on the sample category. Section A.6 and the *FSP* describe the sample matrices associated with each sample category.

B.1.4 Sample Locations

The sampling location for each sample category will be dependent on the sample type and the location of the sample category. The surface water sample will be collected from the surface water present in the F-Pond. Characterization samples will be collected from each grid of the F-Pond and from specific sample points at the North Ditch Staging Area. In-situ treatment characterization samples will be collected from 300 cubic yard sediment/soil volumes in the in-situ treatment areas of the F-Pond and North Ditch Staging Area. Confirmation samples will be collected from the excavated surface of each grid. Backfill and topsoil materials will be sampled at the borrow source location. Groundwater samples will be collected from each monitoring well associated with the units. Representative samples will be collected from each sample category as specified in the *FSP*.

B.2 SAMPLING METHODS

Sampling methods, including sample and data collection procedures, equipment requirements, and performance requirements are provided in the *FSP*. Detailed information regarding sample containers, preservatives and sample volumes is discussed below and presented in Table 1.

B.2.1 Sampling Equipment and Preparation

Prior to sampling, all equipment to be used will be assembled and properly cleaned. The equipment operating condition will also be verified. Arrangements will be made for the repair or replacement of any equipment that is determined to be inoperative. The sampling equipment required during the corrective measures is further described in the *FSP*.

B.2.2 Sample Containers

Sample containers are purchased by the laboratory pre-cleaned and treated according to U.S. EPA specifications for the applicable methods. Sampling containers that are reused are decontaminated between uses by the U.S. EPA-recommended procedures. Containers are stored in clean areas to prevent exposure to fuels, solvents and other contaminants.

B.2.3 Sample Volume and Preservation Requirements

Sample volumes and preservation requirements will be specified by the laboratory performing the analyses in accordance with the appropriate U.S. EPA methods. Preservatives will be added to the sample containers by the laboratory whenever possible. The sample volume and preservation requirements for the analytical methods to be used are listed on Table 1.

B.2.4 Decontamination Procedures

All media sampling equipment that is not dedicated and disposable after use will be decontaminated using a triple rinse procedure. During this procedure, the sampling equipment is scrubbed in a potable water/detergent wash (gross rinse), rinsed in potable water (intermediate rinse), and rinsed with distilled water (final rinse). All three decontamination fluids are changed as needed to ensure proper decontamination; however, to conserve the quantity of waste generated, ENTACT may downgrade the three phase fluids. For example, the final phase fluids are downgraded to intermediate fluids, intermediate fluids are downgraded to gross fluids, gross fluids are collected and used as dust suppression, and fresh distilled water is placed in the final phase. This method minimizes waste and ensures that the final phase fluids are clean. After decontamination, the sampling equipment will be dried with disposable towels and stored in specified sampling boxes between sampling events. All decontaminated equipment within the sampling box will be placed in individual plastic bags or wrapped in aluminum foil. All trash and PPE generated during sampling will be placed in designated disposal containers for such items.

B.3 SAMPLE HANDLING AND CUSTODY

Sample handling and custody is one of several factors that are necessary for the admissibility of environmental data as evidence in a court of law. Custody procedures help to satisfy the 2 major requirements for admissibility: relevance and authenticity. Sample custody is addressed in 3 parts: field sample collection, laboratory analysis and final evidence files. Final evidence files, including all original laboratory reports, are maintained under document control in a secure area.

B.3.1 Field Sample Custody and Documentation

The field sampler is personally responsible for the care and custody of the samples until they are transferred or properly dispatched. Samples will be considered under the custody of the field sampler if:

- The item is in actual possession of the person;
- The item is in the view of the person after being in actual possession of the person;
- The item was in actual physical possession, but is locked up to prevent tampering; or
- The item is in a designated and identified secure area.

Sample identification documents will be carefully prepared prior to and during sample collection to maintain the identification of each sample and control sample disposition. Components of the field documentation procedures include the use of field logbooks, sample labels and COC forms.

B.3.1.1 Field Logbook Records

Field logs of daily activities will be used to record sampling activities on a daily basis. These books will be bound and have consecutively numbered pages. Entries in the field logbook will be made in ink and will include, at a minimum, the: name of the author, date and time of entry, location of activity (including diagrams or maps), names and affiliations of personnel on-site, daily weather report, sample collection or measurement methods, equipment calibration information, number of samples collected, sample identification numbers, field observations and comments, locations of photographs, and descriptions of any deviations from the sampling plan including why the deviation was necessary and any expected impacts on the results of the CMI or laboratory analyses.

ENTACT has devised specific field logbooks for specific tasks, which include self-prompting heading for appropriate information. Separate logbooks will be maintained for overall daily project activities, records of site visitors, air sampling for worker health and safety, XRF field screening, and solid and liquid media samples. The field logbooks will be stored in the document control center when not in use.

B.3.1.2 Sample Labels

Sample labels are necessary to prevent misidentification of samples. Each label will contain space for the following information: name of site, sample identification, date and time of sample collection, media sampled, name of sampler, preservatives, and types of analyses to be performed. An alpha-numeric sample identification system will be used to identify each sample collected. The suggested sample identification system is presented in the *FSP*.

B.3.1.3 Chain-of-Custody Record

A COC form will be completed to record the custody of every sample collected. A COC form will accompany every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from the time of sample collection through sample analysis. An example COC from is presented in Attachment C-1.

The sample portion of the COC form will include the following:

- Project number, name and location;
- Sample identification;
- Name of Project Manager and Sampler;
- Sampling information (sampling area, depth, media type, type of sample, date and time of collection, etc.)
- Analysis to be performed;
- Preservatives used, if any;
- Special directions; and
- Signatures of persons involved in the COC possession, including dates.

When a COC form is filled out, one page of the three-part form is retained and placed in a file at the on-site office. The other two parts of the form accompany the sample to the laboratory and one of the pages is retained by the laboratory and the other is returned with the sample result report. When the sample report is received, it is cross-checked with the COC file record and both COC pages and the laboratory report are placed in a file in fireproof storage at the on-site office. The analytical result is also entered into a computer database consisting of a comprehensive list of all samples taken at the site and the analytical results.

B.3.1.4 Sample Packaging and Shipment Procedures

Sample containers will be laboratory prepared or purchased from sample supply sources and shipped in sealed containers to assure that they remain clean. Sample containers will be selected to ensure compatibility with the media being collected, preserve sample integrity and minimize breakage during transportation. Sample labels will be filled out at the time of sampling and will be affixed to each container to identify sample number, sampler's name, date and time of collection, location of sampling point, and project identification data. After the containers for a given sampling location have been filled out, they will be placed in an insulated cooler to be delivered to the analytical laboratory. Each sample container will be secured in packing material, as appropriate, for shipment to the designated laboratory. Samples that are submitted for analysis of organic constituents or are water samples will be placed on ice. The insulated cooler lid and the drain valve will be taped closed and sealed to avoid the entrance of contaminants into the cooler and to avoid leaking from the cooler. Shipment of samples to the laboratory will take place on the same day as collection or as soon as possible on the next business day. The COC form will be enclosed in a sealed plastic bag and taped inside the sealed cooler. If the samples are sent by common carrier, a bill of lading will be used to document the custody of the sample while in transit. Commercial carriers are not required to sign the COC forms as long as the forms are sealed inside the cooler.

B.3.2 Laboratory Custody Procedures and Documentation

Samples that are delivered by clients or received by courier are placed in a secure Sample Control Area immediately upon delivery. Coolers containing samples are unpacked and placed in the walk-in cooler. The COC accompanying the samples will be signed by the Sample Custodian or their designee at the time of delivery by the client, or in the case of courier delivery, where the COC is sealed up inside of the cooler, at the time of unpacking. At the time of arrival and/or unpacking, coolers will be inspected for evidence of damage. They will be unpacked carefully and samples will be organized on the lab bench in numerical order or by sample sets and assigned a laboratory job number. The condition of both shipping containers and sample containers will be recorded on the internal COC form.

Information on the COC shipped with samples will be verified and recorded as to agreement or non-agreement. Labels will be checked for notation of proper preservation. If there is an apparent document non-agreement or incorrect preservation noted, the apparent problem will be recorded and the ENTACT QA/QC Officer notified. The samples will then be marked or labeled with laboratory sample numbers. Laboratory project numbers are assigned serially, with each sample numbered as a subset of the project number. Finally, samples will be placed in appropriate storage and/or secure areas.

B.4 ANALYTICAL METHODS

The analytical laboratories and the methods to be used in the analysis of the samples collected from the units are described below.

B.4.1 Analytical Laboratories

Samples collected during the corrective measures will be analyzed by one of the following laboratories:

PDC Laboratories, Inc.
2231 W. Altorfer Drive
Peoria, Illinois 61615

Pace Analytical Services
7726 Moller Road
Indianapolis, Indiana 46268

B.4.2 Field Measurements

Field measurements anticipated for this project include the use of XRF field screening and the measurement of water levels and water quality parameters. The procedures for field screening using the XRF, as described in the XRF Standard Operating Procedures included as Attachment B-1 to the *FSP*, and for the measurement of water levels in the monitoring wells and water quality parameters in the purge water, as described in the FSP, will be followed.

B.4.3 Laboratory Analysis

Samples will be submitted to the laboratories listed in Section B.4.1 for analysis of the constituents of concern.

B.4.3.1 Analytical Methods

Samples will be analyzed using the EPA methods listed in Table 1.

B.4.3.2 Detection Limits

The level of concern for each parameter directly affects the data quality requirements. Therefore, the sampling and analysis methods must be accurate for the level of concern. Furthermore, it is necessary that the analytical technique chosen have a detection limit well below the level of concern. Analytical methods that can accurately quantify constituents below their levels of concern will be used for all analyses. The detection limits will generally be much lower than the levels of concern. Therefore, analytical detection limits should be less than the level of concern for each constituent and will be

selected so that any analyzed parameter result can be compared to the appropriate level. Table 2 presents the planned detection limits for the analyses to be conducted.

B.4.3.3 Holding Times

The holding time is defined as the storage time permitted between sample collection and sample extraction or analysis when the designated preservation and storage methods are implemented. The specific holding times associated with each method are presented on Table 1.

B.4.3.4 Quality Control Analyses

Field rinsate blank, duplicates and matrix spike samples will be analyzed to assess the quality of data resulting from the field sampling and analytical programs. Field rinsate blanks, consisting of distilled water used to rinse decontaminated, non-disposable sampling equipment, will be submitted to the analytical laboratory to provide a means to assess the quality of the data resulting from the field sampling program, and to check for procedural contamination at the facility which may cause sample contamination. Field rinsate blanks will be collected at a frequency of 1 per each day of sampling using non-dedicated, non-disposable sampling equipment.

Method blank samples are generated within the laboratory and used to assess contamination resulting from laboratory procedures. Duplicate samples are analyzed to check for sampling and analytical reproducibility. Matrix spikes provide information about the effect of the sample matrix on the digestion and measurement methodology. All matrix spikes are performed in duplicate and are referred to as MS/MSD samples. One MS/MSD will be analyzed for every 20 or fewer samples per sample matrix. The MS/MSD may or may not be from the same batch as the site samples. The general level of the QC effort will be 1 field duplicate for every 10 or fewer samples (excluding TCLP samples).

B.5 QUALITY CONTROL

Internal QC procedures are designed to ensure and document the overall quality of data. Two types of QC checks will be employed to evaluate the performance of the laboratory's analytical procedures. The QC checks represent the system checks and controlled samples introduced into the sample analysis stream that are used to validate the data and calculate the accuracy and precision of the chemical analysis program.

B.5.1 Field Quality Control Checks

B.5.1.1 Quality Control Samples

Project QC checks are accomplished by submitting controlled samples to the laboratory for analysis from the field. Two external types of QC samples will be used: rinsate blanks and duplicates. Field rinsate blanks, consisting of distilled water used to rinse decontaminated sampling equipment, will be submitted to the analytical laboratory to provide a means to assess the quality of the data resulting from the field sampling program, and to check for procedural contamination at the facility which may cause sample contamination. Field rinsate blanks will be collected at a frequency of 1 per each day of sampling using non-dedicated, non-disposable sampling equipment.

Duplicate samples are analyzed to check for sampling and analytical reproducibility. A duplicate sample will be collected for every 10 samples per matrix (excluding TCLP samples) or one duplicate per day, whichever is greater. Any samples submitted as "blind" samples will be noted in the field logbook and given a sample number that does not indicate to the laboratory that the sample is a QC check.

Field rinsate blank, duplicates, and matrix spike samples will be analyzed to assess the quality of data resulting from the field sampling and analytical programs.

B.5.1.2 Field Equipment

The Niton XL 700 Series XRF Analyzer Standard Operating Procedures contain all information necessary for satisfactory operation of the unit as a field screening device. The following field quality control checks will be implemented:

- Daily maintenance and repair, if necessary, of the probe window;
- Performance of a calibration check daily; and
- Daily target element response check using a sample of known concentration.

Calibration checks and target element response checks will be conducted twice daily, prior to and upon completion of field screening activities. The target analytes, target concentrations and acceptability criteria for the readings are provided in the *Niton XRF User Manual.*

The manufacturer's instruction manuals for the Keck Instruments or Solinist Water Level Indicator, HACH Portable Turbidimeter Model 2100P and the YSI 556 Multi-Probe System or YSI Model 85 also contain the information necessary for satisfactory operation of these units. The following quality control checks will be implemented:

- Daily maintenance and repair, if necessary, of unit parts; and
- Performance of a calibration check, as suggested by the manufacturer.

B.5.2 Laboratory Quality Control Checks

The laboratories identified in Section B.4 have QC programs in place to ensure the reliability and validity of the analyses performed at the laboratory. All analytical procedures are documented in writing and include a QC section that addresses the minimum QC requirements for the procedures. The internal QC checks differ slightly for each individual procedure, but in general, the QC requirements include the following:

- Method blanks;
- Reagent/preparation blanks (applicable to inorganic analysis);
- Instrument blanks;
- MS/MSDs;
- Surrogate spikes;
- Laboratory duplicates; and
- Laboratory control standards.

Laboratory system checks and QA/QC samples for inorganics are listed below, since these constitute the majority of the laboratory analyses associated with this project:

- Calibration Blank - A volume of acidified deionized water.
- Continuing Calibration - Analytical standard run every 10 analytical samples or every two hours, whichever is more frequent, to verify the calibration of the analytical system.

- Instrument Calibration - Analysis of analytical standards for a series of different specified concentrations; used to define the quantitative response, linearity, and dynamic range of the instrument to target compounds.

- Preparation Blank - An analytical control that contains deionized water and reagents, carried through the entire analytical procedure. An aqueous method blank is treated with the same reagents as a sample with a water matrix; a solid method blank is treated with the same reagents as a soil sample.

Laboratory QA/QC checks will be performed and samples will be analyzed at a frequency established by appropriate SW-846 protocols. All data obtained will be properly recorded. All media samples submitted to the laboratory for analysis will be reported using Data Quality Objective Level II report formats. This will include a cover sheet, summary of samples submitted and analyzed, case narrative with explanations of any data flags, analytical results, summary quality assurance results, and copies of all signed COC forms. Any samples analyzed in nonconformance with the QC criteria will be reviewed for possible reasons, and reanalyzed if necessary (if sufficient volume is available or within holding times).

B.6 INSTRUMENT / EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

To minimize the occurrence of instrument failure and other system malfunction, a preventive maintenance program for field and laboratory instruments will be implemented. Equipment, instruments, tools, gauges, and other items requiring preventive maintenance will be serviced in accordance with the manufacturer's specified recommendations and written procedures developed by the operators. Maintenance items that cannot be performed by the laboratory technician will be performed by a person certified to repair the instrument. The laboratory will be responsible for performing routine maintenance and will have available tools and spare parts to conduct routine maintenance.

Manufacturer's procedures identify the schedule for servicing critical items in order to minimize the downtime for the measurement system. It will be the responsibility of the field instrument operator and the laboratory to adhere to this maintenance schedule and arrange any necessary and prompt service. Service to the equipment, instruments, tools, gauges, etc., shall be performed by qualified personnel.

Logs are used to record maintenance and service procedures and schedules. All maintenance records will be documented and traceable to the specific equipment, instruments, tools, and gauges. Any items found to be inoperable will be taken out of use and a note stating the time and date of this action will be made in the calibration sheets and logs. The reason for equipment failure and the time and date of its return to service will also be noted in the logbook. Records produced shall be reviewed, maintained, and filed by the operators at the laboratories and by the data and sample control personnel when and if equipment, instruments, tools, and gauges are used at the site. The ENTACT Regulatory/Technical Officer will audit these procedures.

B.7 INSTRUMENT / EQUIPMENT CALIBRATION AND FREQUENCY

Procedures described in this section pertain to the calibration, maintenance and operation of equipment and instrumentation to be used during the implementation of the corrective measures. A variety of instruments, equipment and sampling tools will be used to collect data and samples to monitor site conditions. Proper calibration, maintenance and use of instruments and equipment are imperative to ensure the quality of all data collected. A record of calibration and maintenance activities is important to provide legally dependable data. Instruments and equipment used to gather, generate or measure environmental and physical testing data will be calibrated with sufficient frequency and in such a manner that accuracy and reproducibility are consistent with the manufacturer's specifications.

B.7.1 Field Instrument Calibration

All instruments and equipment purchased or used for the project will be inspected to ensure that the item meets and performs to manufacturer specifications and project specifications. Instruments meeting these requirements are issued to a field technician trained in instrument operation and made available for site use. Field instruments that will be used during this project include an XRF field screening unit, personal air samplers, real-time air monitors, water level indicators, and instruments to measure water quality parameters.

The XRF will be calibrated with the manufacturer-supplied standards prior to each day's use in accordance with the manufacturer's instructions and the XRF Standard Operating Procedures. A record of the instrument calibration will be maintained in the field logbook. Information recorded will include the following:

- Date of calibration;
- All data pertaining to the calibration procedures;
- Initials of analyst performing calibration;
- Adjustments made to equipment prior to and following calibration; and
- Record of equipment failure or inability to meet specifications.

The personal air samplers and real-time air monitors will be calibrated in the field on a daily basis per manufacturer's specifications. The samplers and monitors will be calibrated on an annual basis by the manufacturer according to their recommendations.

The water quality parameter instrument will be calibrated prior to use, as suggested by the manufacturer. The water level indicator will be inspected prior to use, as calibration is not required, to ensure that all parts are in good condition and working properly.

Any items found to be inoperable will be taken out of use and a note stating the time and date of this action will be made in the calibration/maintenance logs. The reason for equipment failure and the time and date of its return to service will also be noted in the logbook. Records produced shall be reviewed, maintained, and filed by the data and sample control personnel.

B.7.2 Laboratory Instrument Calibration

Calibration procedures for a specific laboratory instrument will consist of initial calibrations (3 or 5-points), initial calibration verifications, and continuing calibration verification. Calibration for the inductively coupled plasma (ICP) will utilize stock solutions, which are high purity standards. The supplier, purity, date received, and analyst initials are documented in the standards record book and the stock solutions given a unique identification number. Working standards are prepared by diluting the stock. The calibration standards are prepared by diluting the stock standard.

The instrument is calibrated beginning with a blank and one standard. After the instrument is calibrated, the calibration curve is verified by the analysis of an initial calibration verification standard (ICVS). The ICVS is an independently prepared standard from a second manufacturer or a different lot from the same manufacturer. If the ICVS sample analysis exceeds the control limits, the analysis is ended and the problem is investigated and corrected.

To assure calibration accuracy through each analysis run, the continuing calibration verification (CCV) sample must be analyzed at a frequency of 1 CCV per 10 samples analyzed. The CCV is also analyzed after the last analytical sample. If the CCV is outside the control limits, the analysis must be terminated and the instrument re-calibrated.

B.8 INSPECTION / ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Sampling equipment and supplies required during the corrective measures will consist of in-house equipment or laboratory-supplied materials. The QA/QC Officer will be responsible for securing the necessary equipment and supplies during the mobilization phase of the project. The equipment and supplies will be inspected prior to acceptance to ensure that they are in satisfactory condition and are free from defects. Checks and balances are in place to ensure that malfunctioning equipment is repaired or replaced without interruption to the overall usage of the equipment.

B.9 NON-DIRECT MEASUREMENTS

The use of non-direct measurements is not anticipated for project implementation or decision making.

B.10 DATA MANAGEMENT

Data generated during the project will be appropriately identified, validated, and summarized as the data is received from the laboratory. As such, the data will be available for review as soon as possible after receipt and validation. The ENTACT QA/QC Officer will develop a data storage and information system to facilitate data for tracking, data calculations, and transfer of data to various forms and reports and transmittal of data into a data storage system. Data packages from the laboratory will be in the form of a Level II QC package.

Data reporting to the ENTACT Regulatory/Technical Officer or QA/QC Officer will be performed by the ENTACT QA Technician or the ENTACT QA/QC Officer. After data validation and reduction, the ENTACT QA Technician will report data to the ENTACT QA/QC Officer and Regulatory/Technical Officer. The ENTACT QA/QC Officer will summarize the data obtained and include the information in the field activity report submitted to the ENTACT Project Coordinator for review. The ENTACT Project Coordinator will then prepare scheduled reports to Keystone. It is expected that the more frequent reports will contain summaries of data results, while monthly reports will provide all previous data summaries and a summary of QA/QC activities and corrective actions, if necessary.

The appropriate documents will be prepared and distributed that summarize both the field activities performed and the results obtained. The field reports will include: a presentation of results, summaries of field data from field measurements, and field location of sampling points. All other information will be bound in the appendices. The laboratory reports will include, at a minimum, the following components:

- Report title page;
- Date of issuance;
- Any deviations from the intended analytical strategy;
- Laboratory batch number;
- Number of samples and respective matrices;
- Project name and number;
- Condition of samples;
- Discussion of holding times;
- Discussion of technical problems or observations;
- Discussion of quality control checks which failed;

- Sample description information;
- Analytical tests assigned;
- Analytical results;
- Quality control reports;
- Description of analytical methodology;
- Description of QC methodology; and
- Signature of Laboratory Operations Manager.

Both the field and laboratory reports will contain the following:

- Any changes in the QAPP;
- Significant QA problems, recommended solutions, and results of corrective actions;
- Discussions of whether the QA objectives were met, and the resulting impact on decision making; and
- Limitations on the use of the measurement data.

C.1 ASSESSMENTS AND RESPONSE ACTIONS

Two types of audit procedures will be used to assess and document performance and project staff: system audits and performance audits. These audits are performed at frequent intervals under the direction of the ENTACT Regulatory/Technical Officer to evaluate quantitatively the accuracy of the total measurement system. These audits form the basis for corrective action requirements and provide a permanent record of the conformance of measurement systems to QA requirements.

System audits consist of the quantitative evaluation of field and laboratory quality control measurement systems to determine if they are used appropriately. These audits may be carried out before all systems are operational, during the program, or after the completion of the program. These audits involve a comparison of the activities presented in the QA plan with those actually scheduled or performed.

Performance audits are a quantitative evaluation of the measurement systems of the program. They require testing of the measurement systems with samples of known composition or behavior to evaluate precision and accuracy after systems are operational and generating data. Analytical laboratories designated to perform analytical services during the project will be audited prior to sample analysis.

C.1.1 Internal Audits

A systems audit will be performed prior to or shortly after systems are operational on laboratory, office and field operations. The system audit protocols are summarized as follows:

Laboratory Operations: Laboratory QA/QC Officer

- Parameter and/or laboratory notebooks;
- Instrument/equipment logbook;
- Sample log-in, routing, and labeling for analysis; and
- Updating of QC criteria for spike recoveries. In addition, the QA/QC Officer will monitor analyses to assure complete adherence to approved analytical methods.

Field Operations: ENTACT QA/QC Officer or Regulatory/Technical Officer

- Field notebooks, procedures, field logs, boring logs, etc.
- Site safety;
- Sampling methods; and

- Sample labeling, packing, storage, shipping, and chain-of-custody procedures.

Office Operations: ENTACT Project Coordinator or designated personnel

- Project team members are informed of the team organization and in particular the quality control procedures for their work assignment; and
- Quality control officers assigned to the project are available and informed of the quality control they are responsible for, and the schedule for quality control review.

After systems are operational and generating data, a performance audit will be conducted at least once during the laboratory, office and field work to determine the accuracy of the total measurement systems or component parts thereof. The performance audit protocol is summarized as follows:

Laboratory Operations: Laboratory QA Manager

- Sample log-in, routing, and labeling for analysis;
- Analyses to assure complete adherence to approved test methods; and
- Other quality control procedures outlined herein.

Field Operations: ENTACT QA/QC Officer or Regulatory/Technical Officer

- Field notebooks, procedures, field logs, boring logs, etc.
- Site safety;
- Sampling methods; and
- Sample labeling, packing, storage, shipping, and chain-of-custody procedures.

Office Operations: ENTACT Project Coordinator or designated personnel

- Specified quality control reviews of the work are being performed;
- The individuals performing the quality control reviews are qualified and assigned; and
- Final reports and deliverables have received the appropriate QC review.

The auditor will maintain a record of his evaluation by writing field notes. Following the audit, the preliminary results will be reviewed with the person in charge of the operations audited. Subsequent to the audit, the auditor will develop an audit report that summarizes the areas requiring corrective measures. This report will be submitted to the ENTACT Project Coordinator.

When it is necessary to determine the capacity of a subcontractor's quality assurance program prior to award of subcontractor, the ENTACT Project Coordinator, ENTACT QA/QC Officer and/or ENTACT Regulatory/Technical Officer will visit the subcontractor's operations to verify performance and coordinate the subcontracted services.

C.1.2 External Audits

In addition to these internal field and laboratory audits, external field and laboratory audits may be performed as necessary by the U.S. EPA Project Manager. The external field audits may be conducted any time during the field operations and may or may not be announced. The external lab audit will include, but is not be limited to, review of laboratory procedures, laboratory on-site audits and/or submission of performance verification samples to the laboratory for analysis.

C.1.3 Response Actions

The following procedures have been established to assure that conditions adverse to quality, such as malfunctions, deficiencies, deviations, and errors, are promptly investigated, documented, evaluated, and corrected. When a significant condition adverse to quality is noted at the site, laboratory, or subcontractor locations, the cause of the condition will be determined and corrective action taken immediately. All project personnel have the responsibility to promptly identify, solicit approved correction, and report conditions adverse to quality. Conditions that warrant corrective action include:

- Predetermined acceptance standards are not attained;
- Procedures or data compiled are determined to be faulty;
- Equipment or instrumentation is found to be faulty;
- Samples and test results are questionably traceable;
- Quality assurance requirements have been violated; and
- System and performance audits indicate problems.

C.1.3.1 Field Corrective Action

The need for corrective action will be identified as a result of the field audits previously described. If problems become apparent that are identified as originating in the field, immediate corrective action will take place. If immediate corrective action does not resolve the problem, appropriate personnel will be assigned to investigate and evaluate the cause of the problem. When a corrective action is implemented, the effectiveness of the action will be verified such that the end result is elimination of the problem.

Corrective action in the field can be needed when the sample network is changed, sampling procedures, and field analytical procedures require modification due to unexpected conditions. In general, the Field Team, Field Project Manager, Regulatory/Technical Officer, or QA/QC Officer may identify the need for corrective action. The ENTACT field staff in consultation with the ENTACT Field Project Manager will recommend the corrective action. The ENTACT Field Project Manager will approve the corrective measure that will be implemented by the ENTACT Field Team. It will be the responsibility of the ENTACT Field Project Manager to ensure that corrective action has been implemented.

If the corrective action will supplement the existing sampling plan using existing and approved procedures in the QAPP, corrective action approved by the ENTACT Field Project Manager will be documented. If corrective actions resulting in less samples, alternate locations, etc. which may cause project quality assurance objectives not to be achieved, it will be necessary that all levels of project management, including U.S. EPA, concur with the proposed action.

Corrective action resulting from internal field audits will be implemented immediately if data may be adversely affected due to unapproved or improper use of approved methods. The ENTACT Regulatory/Technical Officer or QA/QC Officer will identify deficiencies and recommend corrective action to the ENTACT Project Coordinator. Implementation of corrective actions will be performed by the ENTACT Field Project Manager and the ENTACT Field Team. Corrective action will be documented in quality assurance reports to the entire project management. The U.S. EPA will be notified immediately if any problems affecting data quality occur.

Corrective actions will be implemented and documented in the field record book. No staff member will initiate corrective action without prior communication of findings through the proper channels. If corrective actions are insufficient, work may be stopped by U.S. EPA.

C.1.3.2 Laboratory Corrective Action

The need for corrective action resulting from QA audits will be initiated by the laboratory QA/QC Officer in consultation with the Laboratory Operations Manager. The corrective actions will be performed prior to the release of data from the laboratory. The corrective action will be documented in the logbook and submitted to the data validator. If the corrective action does not rectify the situation, the laboratory will contact the ENTACT Regulatory/Technical Officer or QA/QC Officer. If the nonconformance causes project objectives not to be achieved, it will be necessary to inform all levels of ENTACT management at the site, Keystone and the U.S. EPA. Corrective action may include, but is not limited to:

- Reanalyzing the samples, if holding time criteria permit;
- Evaluating and amending sampling and analytical procedures;
- Accepting data with an acknowledged level of uncertainty; and

- Resampling and analysis, if the completeness of the data set or intended use of the data is recognized during a preliminary review to be insufficient to meet program Data Quality Objectives (DQOs).

If the above corrective actions are deemed unacceptable, an alternate laboratory will be selected to perform necessary analyses.

C.1.3.3 Corrective Action During Data Validation and Data Assessment

The ENTACT Project Coordinator, Regulatory/Technical Officer or QA/QC Officer may identify the need for corrective action during either the data validation or data assessment. Potential types of corrective action may include resampling by the field team or reinjection/reanalysis of samples by the laboratory. These actions are dependent upon the ability to mobilize the field team, whether the data to be collected is necessary to meet the required quality assurance objectives (e.g. the holding time has not been exceeded, etc.).

The ENTACT QA/QC Officer is responsible for identifying a corrective action situation, documenting the incident, determining the course of action, and implementing the corrective action.

C.1.3.4 Immediate Corrective Action

Any equipment and instrument malfunctions will require immediate corrective actions. The laboratory QC charts are working tools that identify appropriate immediate corrective actions to be taken when a control limit has been exceeded. They provide the framework for uniform actions as part of normal operating procedures. The actions taken should be noted in field or laboratory logbooks. A detailed description of method-specific corrective action limits is provided in the appropriate method. Any deviation from the prescribed control limits must be approved in writing by the designated ENTACT Regulatory/Technical Officer or QA/QC Officer.

C.1.3.5 Long-Term Corrective Action

The need for long-term corrective action may be identified by standard QC procedures, control charts, and system audits. Any procedural or data quality problem that cannot be solved by immediate corrective action becomes a long-term corrective action. The essential steps in a corrective action system are as follows:

- Identification and definition of the problem;
- Investigation and determination of the cause of the problem;
- Determination and implementation of a corrective action to eliminate the problem; and
- Verification that the corrective action has eliminated the problem.

Documentation of the problem is important in corrective action. The responsible person may be an analyst, ENTACT QA/QC Officer, laboratory QA/QC Officer, sampler, or the ENTACT Field Project Manager. In general, the designated QA/QC Officer will investigate the situation and determine who will be responsible for implementing the corrective action. The QA/QC Officer will verify that the corrective action has been taken, appears effective, and that the problem has been resolved. The required corrective action will be documented by the designated ENTACT QA/QC Officer and the ENTACT Field Project Manager for field activities. The corrective action will be discussed with the ENTACT Project Coordinator, Keystone and the U.S. EPA prior to implementation if the severity of the problem warrants such discussion.

Any changes proposed for amending sampling and analytical procedures will be approved by the U.S. EPA prior to implementation. These changes will be documented in quarterly progress reports and addenda to the QAPP.

Project management and staff, including field investigation teams, document and sample control personnel, and laboratory groups, will monitor on-going work performance in the normal course of daily responsibilities. Work will be monitored at the site by the ENTACT Project Coordinator. Following identification of an adverse condition or quality assurance problem, the ENTACT QA/QC Officer will notify the ENTACT Project Coordinator of the problem.

C.2 REPORTS TO MANAGEMENT

QA reports will be prepared throughout the duration of the corrective measures to inform management of the status of project activities, including results of performance evaluation and system audits, results of periodic data quality assessments and significant quality assurance problems and recommended solutions. The QA reports will be prepared on a monthly basis and forwarded to the appropriate parties.

C.2.1 Contents of a Project QA Report

Analytical results for samples analyzed during the project will be submitted to the ENTACT Project Coordinator following a QA/QC review. The results will include a tabulation of the analytical data and an explanation of any field conditions or laboratory QA/QC problems and their effects on data quality. Results of performance audits and system audits will also be included, as appropriate. Proposed corrective action will be recommended in the event that QA problems are identified during review of data quality or results of performance or system audits.

The final report will contain a discussion of QA/QC evaluations summarizing the quality of the data collected and/or used as appropriate to each activity of the project. The objective of the QA/QC summary will be to ensure that the data are representative of site conditions and sufficient in quality and quantity to support the field activities. The QA/QC summary will include:

- Tabulated results of all field and analytical data;
- A report from the Laboratory QA Manager evaluating the validity of the analytical data with respect to accuracy, precision, completeness, and representativeness; and
- A report from the ENTACT Regulatory/Technical Officer evaluating the results of field and office audits.

A quality assurance report will be prepared by the Regulatory/Technical Officer or QA/QC Officer upon receipt of sufficient QA data from the laboratory. The report will be a summary of QA/QC results of the analytical work conducted. A summary of the QA/QC results will be included as part of the *Corrective Measures Implementation Report.*

C.2.2 QA Reporting and Routing Schedule

The QA Reports will be prepared on a monthly basis and will be delivered to the Project Coordinator by the end of the first full week of the following month. The QA reports will continue without interruption, until the project has been completed.

D.1 DATA REVIEW, VERIFICATION AND VALIDATION

All data collected will be managed, distributed, and preserved to substantiate and document that data are of known quality and are properly maintained. Technical data will be tracked and validated to monitor the performance of the tasks. An outline of the QC data handling process for data collection, transfer, validation, reduction, reporting, and storage for both field and laboratory QC data is as follows. The ENTACT QA/QC Officer and Regulatory/Technical Officer are responsible for these tasks.

D.1.1 Data Reduction

Data quality and utility depends on many factors, including sampling methods, sampling preparation, analytical methods, quality control, and documentation. Once all physical and chemical data are validated and assembled, these data are further evaluated with respect to PARCC parameters. Satisfaction of these criteria will be documented as listed below. Chemical data must meet criteria of (1) quantitative statistical significance, (2) custody and document control, and (3) sample representativeness. Physical data must meet criteria of (1) sampling location, time, and personnel; (2) documentation; and (3) methodologies.

To determine the quantitative statistical significance of chemical data, the following items will be documented as appropriate:

- Laboratory/field instrumentation, including calibration data, standard methods, and references;
- Proper sample bottle preparation;
- Laboratory analysis detection limits;
- Analysis of laboratory (reagent) blanks at a frequency of at least one per 20 samples per matrix;
- Analysis of laboratory spikes at a frequency of at least 1 per 20 samples or one per analytical batch;
- Analysis of field replicates (duplicates or splits) at a frequency of at least 1 per 10 samples for each matrix or one per day, whichever is greater;
- Analysis of laboratory replicates (duplicates or splits) at a frequency of at least 1 per 20 samples;
- Presentation of tabulated QC data; and
- QA/QC certification of the laboratory and/or participation in round-robin testing by and/or with EPA accredited agencies.

To evaluate the custody and document control for samples and results, the following items will be documented:

- Field custody noted in field logbook or chain-of-custody documentation available;
- Samples hand-delivered to laboratory or chain-of-custody documentation available;
- Laboratory custody documented by chain-of-custody documentation from either field personnel or shipper;
- Laboratory custody documented through designated laboratory sample custodian with secured sample storage area;
- Sample designation number(s) traceable through entire laboratory monitoring system;
- Field notebooks and all custody documents stored in secure repository or under the control of a document custodian;
- All forms filled out completely in indelible ink without alterations except as initials;
- Identity of sampler; and
- Date of sample collection, shipping, and laboratory analysis.

To determine sample representativeness, the following items must be checked:

- Compatibility between appropriate field and laboratory measurements or suitable explanation of discrepancy;
- Analysis within holding time limits suitable for the preservation and analysis methods used;
- Sample storage within suitable temperature, light, and moisture conditions;
- Proper sample containers used;
- Proper sample collection equipment used and properly decontaminated;
- Proper sample preservation;
- Proper laboratory preparation techniques used;
- An evaluation of factors to determine bias screening; and
- Sample site selection criteria to provide representativeness.

To evaluate the field physical data that support the analytical data, the following items will be documented:

- Sampling date and time;
- Sampling personnel;
- Sampling location;
- Physical description of sampling location;
- Sample collection technique;
- Field preparation techniques;
- Visual classification of sample using an accepted classification system;
- A thorough description of the methodology used and a rationale for the use of that methodology;
- Complete documentation of record-keeping practices;
- Field notebook and all custody documents stored in a secure repository or under the control of a document custodian; and
- All forms filled out in indelible ink without alterations except as initialed.

D.1.1.1 Field Data Reduction Procedures

Field data reduction is not anticipated for this project.

D.1.1.2 Laboratory Data Reduction Procedures

The lab supervisor will review the lab notebook and associated computer printouts to ensure all information is accurate and no errors have occurred. Prior to laboratory release of the data, QA/QC will be performed to assess precision and accuracy requirements of the data have been met.

D.1.2 Data Validation

Technical data, including field data and results of laboratory sample analyses, will be validated to monitor the performance of the corrective measures. The data collection and quality assurance procedures for validating field and laboratory data are described below. Field precision is assessed through the collection and measurement of field duplicates at a rate of 1 duplicate per 10 analytical samples (except TCLP samples).

D.1.2.1 Procedures Used to Validate Field Data

The ENTACT QA/QC Officer or Regulatory/Technical Officer will perform validation of data obtained from field measurements. Such validation will be performed by regularly checking procedures utilized in the field and comparing the data to previous measurements. Data that cannot be validated will also be documented. Field data requiring validation includes the raw data and supportive documentation generated from field investigations and will include, but is not limited to, the following:

- Field notebooks;
- Field investigation daily reports;
- Field instrument readings and calibration data sheet;
- Field log borings;
- Sample labels;
- Chain-of-custody forms;
- Sample tracking records;
- Surveying information; and
- Maps.

Additional specific evaluations of data critical to the integrity of the decision making process for this task will be performed on 10 percent of the data and will include:

- Chain-of-custody integrity check;
- Review of the appropriateness of field methodologies;
- Transcription, calculation, completeness, and accuracy check of field data; and
- Analysis of field notes to determine presence of bias.

D.1.2.2 Procedures Used to Validate Lab Data

Under the direction of the ENTACT QA/QC Officer or Regulatory/Technical Officer, lab data will be reviewed by the Laboratory Manager to ensure that results for samples meet all method specified criteria. The requirements to be checked in validation are:

- Sample holding times;

- Calibration;
- Blanks;
- Matrix spike/Matrix spike duplicate;
- Field duplicate;
- Target compound identification;
- Interference check sample analysis;
- Compound quantitation and reported detection limits;
- System performance;
- Overall assessment of data;
- Interference check sample analysis; and
- Laboratory control sample analysis.

One equipment rinsate blank will be prepared and documented for every 10 samples to assess the accuracy of sampling techniques. One matrix spike and matrix spike duplicate will be analyzed for every 20 samples. The laboratory QA/QC Officer will be responsible for assessing data quality and advising appropriate laboratory section supervisors of any data that are "unacceptable" or have notations that would caution the data user to possible unreliability. Data reduction, validation, and reporting by the laboratory will be conducted as follows:

- Raw data produced by the analyst will be turned over to the respective supervisor.
- The supervisor will review the data for attainment of QC criteria as outlined in method protocols and established U.S. EPA methods.
- Upon acceptance of the raw data by the supervisor, a computerized report will be generated and sent to the ENTACT QA/QC Officer along with the data report.
- The ENTACT QA/QC Officer will complete a thorough audit of all reports.

The ENTACT QA/QC Officer or Regulatory/Technical Officer will conduct an evaluation of data reduction and reporting by the laboratory. These evaluations will consider the finished data sheets, calculation sheets, document control forms, blank data, duplicate data, and recovery data for matrix and surrogate spikes. The material will be checked for legibility, completeness, and the presence of necessary

dates, initials, and signatures. The results of these checks will be assessed and reported, noting any discrepancies and their effect upon acceptability of the data. In addition, the ENTACT QA/QC Officer or Regulatory/Technical Officer will check for data consistency by assessing comparability of duplicate analyses, comparability to previous criteria, transmittal errors, and anomalously high or low parameter values. The results of these checks will be reported in writing.

The following is a description of the validation steps that will be used by the ENTACT QA/QC Officer or Regulatory/Technical Officer to validate the laboratory data. These validation results will be summarized in the *Corrective Measures Implementation Report*. The validation steps are as follows:

- Compile a list of all samples;
- Compile a list of all QC samples;
- Review laboratory analytical procedures and instrument performance criteria;
- Specific evaluations critical to the integrity of the data include:
- Review of chain-of-custody documents for completeness and correctness;
- Transcription, calculation, completeness, and accuracy check; and
- Review of laboratory analytical procedures, appropriateness, and instrument performance criteria.

A data summary will be prepared and will include:

- Results;
- Sample media identification;
- Sample location and description;
- Appropriate concentration units;
- Appropriate significant figures;
- Data qualifiers; and
- Definitions.

The laboratory data summary will be reviewed for potential data quality problems, including:

- Unexpected results;

- Common laboratory contaminants;
- Samples in which dilution was necessary; and
- Time and date of sample collection.

A sample data summary will be prepared to assess precision, accuracy, and completeness of the analytical data. Laboratory records and data package requirements will be checked to assess completeness of the data package.

An independent third party validator will also be used to validate a representative portion of the post-excavation confirmation sampling data (approximately 10%) to ensure adequacy of the data in verifying attainment of the remediation goals. The data will be validated in accordance with U.S. EPA's National Functional Guidelines for Inorganic Data Review. The results of this validation will be reported to ENTACT in writing.

Despite all efforts to achieve the objectives of the project, the potential for error exists in laboratory chemical analyses and in the data reporting process. Every reasonable effort will be made to compare and double-check data reported from the laboratory, data entered into the data base management system.

D.2 VERIFICATION AND VALIDATION METHODS

The elements of this section are contained in Section D.1.

D.3 RECONCILIATION WITH USER REQUIREMENTS

This section summarizes the QA/QC procedures used in assessing the quality of the chemical data and the format for presenting the results of the QA/QC evaluations. The data evaluation procedures will be used by the Regulatory/Technical Officer and QA/QC Officer for assessing duplicate and spike samples and checking blank samples that are submitted blind to the analytical laboratories from the field or generated internally by the laboratory, in accordance with this QAPP. The purpose of implementing these procedures is to assess the chemical data generated for accuracy, precision, representativeness, and completeness for both the laboratory analytical program and field sample collection activities.

The primary goal of the program is to ensure that the data generated are representative of environmental conditions at the site. Accuracy, precision, representativeness, and completeness will be computed in the manner described in the following paragraphs. A qualitative assessment of accuracy, precision, representativeness, and completeness will be made and documented. The goal of the assessment will be to (1) establish site specific PARCC parameters; (2) use the parameters to develop a database with known limitations of data usability; and (3) evaluate these limitations in achieving the project DQOs. Complex statistical data verification and a significance evaluation will not be performed. If a problem arises and the data are found to deviate from previous analyses or surrounding conditions, the data will be annotated. Sample recollection and analysis will be used only in extreme cases of QC problems.

Chemical data will be evaluated according to accuracy, precision, representativeness, and completeness criteria for both the field sample collection activities and laboratory analytical programs. The QA/QC program will evaluate data based on 3 types of quality control samples (matrix spikes, blanks and duplicates).

The completeness of the data represents the amount of valid data obtained from the field programs versus the amount of data expected under normal conditions. Completeness will be assessed prior to preparation of the final report. These procedures for evaluating the field and laboratory QA/QC data are the same and are presented below for QA/QC matrix spike, blank, and duplicate samples.

D.3.1 Accuracy Assessment

In order to assure the accuracy of the analytical procedures, an environmental sample is randomly selected from each sample shipment received at the laboratory, and spiked with a known amount of the analyte to be evaluated. In general, a sample spike should be included in every set of 20 samples tested on each instrument. The spike sample is then analyzed. The increase in concentration of the analyte observed in the spiked sample, due to the addition of a known quantity of the analyte, compared to the reported value of the same analyte in the unspiked sample determines the percent recovery. Daily control charts are plotted for each commonly analyzed compound and recorded. The percent recovery for a spiked sample is calculated according to the following formula:

$$\% \text{ Recovery} = \frac{\text{Amount in spiked sample - Amount in sample}}{\text{Known amount added}} \times 100$$

D.3.2 Precision Assessment

Spiked samples are prepared by choosing a sample at random from each sample shipment received at the laboratory, dividing the sample into equal aliquots, and then spiking each of the aliquots with a known amount of analyte. The duplicate samples are then included in the analytical sample set. The splitting of the sample allows the analyst to determine the precision of the preparation and analytical techniques associated with the duplicate sample. The relative percent difference (RPD) between the spike and duplicate spike are calculated and plotted. The RPD is calculated according to the following formula:

$$\text{RPD} = \frac{\text{Amount in Spike 1 - Amount in Spike 2}}{0.5\ (\text{Amount in Spike 1} + \text{Amount in Spike 2})} \times 100$$

D.3.3 Completeness Assessment

Completeness is the ratio of the number of valid sample results to the total number of samples analyzed with a specific matrix and/or analysis. Following completion of the analytical testing, the percent completeness will be calculated by the following equation:

$$\text{Completeness} = \frac{\text{(Number of valid measurements)}}{\text{(Number of measurements planned)}} \times 100$$

D.4 REFERENCES

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U.S. Environmental Protection Agency. *Statement of Basis.* Chicago, Illinois: U.S. Environmental Protection Agency Region 5, October 14, 2005.

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TABLES

TABLE 1: LIST OF PARAMETERS AND TEST METHODS

Test Description	Sample Matrix	Test Method	Frequency	Container	Preservation	Sample Size	Maximum Holding Time
Characterization Samples							
TCLP Lead	Sediment/ Soil	SW-846 1311/6010B	1 4-pt composite per grid or 1 grab per sample location	Plastic/ Glass	None	4oz	6 months
Total Lead and Iron	Sediment/ Soil	SW-846 3051/6010B	1 4-pt composite per grid	Plastic/ Glass	None	4oz	6 months
Post-Excavation Confirmation Samples							
Total Lead and/or Iron	Sediment/ Soil	SW-846 3051/6010B	1 4-pt composite per grid bottom and sidewall	Plastic/ Glass	None	4 oz	6 months (28 days for Hg)
TCLP Lead	Sediment/ Soil	SW-846 1311/6010B	1 4-pt composite per grid	Plastic/ Glass	None	4oz	6 months
Backfill/Topsoil Characterization Samples							
Total RCRA 8 Metals (As, Ba, Cd, Cr, Pb, Hg, Se, Ag)	Backfill	SW-846 3051/6010B/7 471A	1 4-pt composite per source	Plastic/ Glass	None	4 oz	6 months (28 days for Hg)
TPH	Backfill	SW-846 5030B/8015B	1 4-pt composite per source	Plastic/ Glass	Cool to 4°C	4 oz	14 days
SVOCs	Backfill	SW-846 3550B/8270C	1 4-pt composite per source	Glass	Cool to 4°C	4 oz	14 days to extraction, 40 days to analysis
Surface Water Samples							
Total Lead, Iron and	Water	SW-846	1 sample	Plastic/	HNO_3 to pH <2	500 ml	6 months

TABLE 1: LIST OF PARAMETERS AND TEST METHODS							
Test Description	**Sample Matrix**	**Test Method**	**Frequency**	**Container**	**Preservation**	**Sample Size**	**Maximum Holding Time**
Manganese		3010A/6010B		Glass	Cool to 4°C		
Trichloroethylene	Water	SW-846 8260B	1 sample	Glass	H_2SO_4, HCl or $NaHSO_4$ to pH <2, Cool to 4°C	2, 40 ml VOAs	14 days
Groundwater Samples							
Total Lead	Groundwater	SW-846 3010A/6010B	1 per monitoring well	Plastic/ Glass	HNO_3 to pH <2 Cool to 4°C	500 ml	6 months

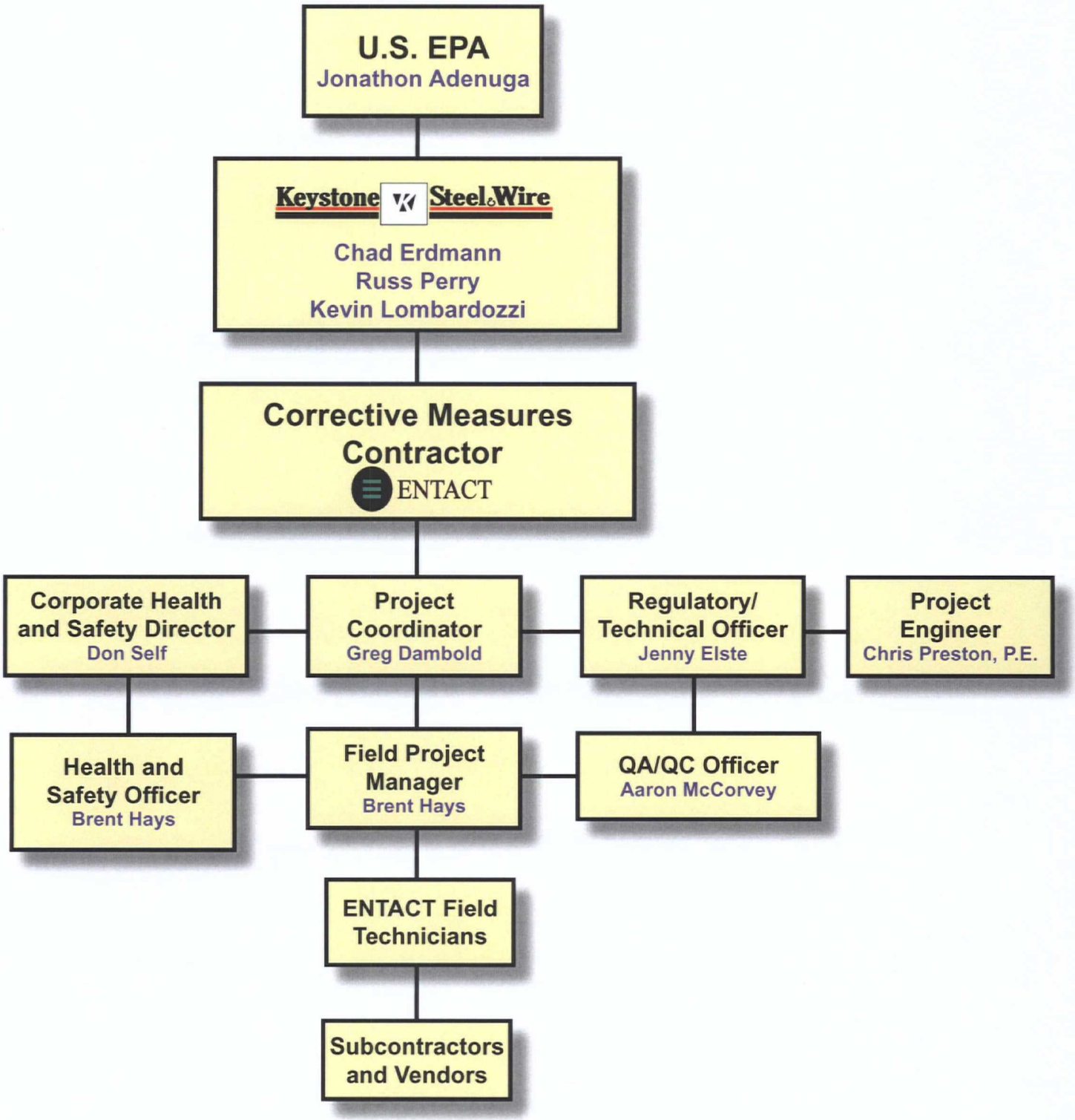
TABLE 2: LIST OF LABORATORY DATA QUALITY ASSURANCE OBJECTIVES

Test Description	Test Method	Sample Matrix	Target Reporting Limit[1]	Accuracy (% Recovery)	Precision (% RPD)	Completeness
Total Metals (As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Fe, Mn)	SW-846 3051 or 3010A/ 6010B/7471A	Solid/ Water	Required IEPA PQL	80-120	0-20	90%
TCLP Lead	SW-846 1311/6010B	Solid	Required IEPA PQL	80-120	0-20	90%
VOCs	SW-846 8260B	Water	Required IEPA PQL	Varies by analyte	0-40	90%
SVOCs	SW-846 3550B/8270C	Solid	Required IEPA PQL	Varies by analyte	0-40	90%
TPH	SW-846 5030B/8015B	Solid	GRO 1 mg/kg DRO 10 mg/kg	GRO 45-170 DRO 35-130	GRO 0-20 DRO 0-35	90%

FIGURES

PROJECT ORGANIZATIONAL CHART

Figure 1



ATTACHMENT C-1

Example Chain-of Custody Form

CHAIN OF CUSTODY RECORD

SAMPLE T
- ☐ Treated Stockpile
- ☐ Untreated Stockpile
- ☐ Excavation Verification
- ☐ Air _____
- ☐ Groundwater
- ☐ Other _____

☐ **CHICAGO OFFICE**
1010 EXECUTIVE COURT
SUITE 280
WESTMONT, IL 60559
630.986.2900
630.986.0853 f

☐ **DALLAS OFFICE**
4040 WEST ROYAL LANE
SUITE 136
IRVING, TX 75063
972.580.1323
972.550.7464 f

"Safety keeps you ENTACT"

PROJECT INFORMATION

NAME	JOB NUMBER
LOCATION	PHONE
CONTACT	EMAIL

REQUIRED TURNAROUND
- ☐ Standard
- ☐ 5 Day
- ☐ 3 Day
- ☐ 48 Hour
- ☐ 24 Hour

DETECTION LIMIT CRITERIA

COMMENTS

SAMPLE NUMBER	DESCRIPTION	DATE	TIME	TYPE: MATRIX	TYPE: GRAB	TYPE: COMPOSITE	PRESERVATIVE: HCL	PRESERVATIVE: HNO3	PRESERVATIVE: NONE	PRESERVATIVE: ICE	AIR: CANISTER (L)	AIR: CANISTER (ml)	AIR: TUBE VOLUME	NUMBER OF CONTAINERS SUPPLIED FOR EACH SAMPLE	ANALYSES / METHOD	FILTERED Y / N FIELD / LAB — MICRON FILTER

SHIPPING METHOD:		AIRBILL NO:				SAMPLER:				LAB NAME:	
RELINQUISHED BY:	DATE	RELINQUISHED BY:	DATE			RELINQUISHED BY:	DATE			LAB JOB #	
SIGNATURE:		SIGNATURE:				SIGNATURE:					
PRINTED NAME:	TIME	PRINTED NAME:	TIME			PRINTED NAME:	TIME				
RECEIVED BY:	DATE	RECEIVED BY:	DATE			RECEIVED BY:	DATE			TEMPERATURE UPON RECEIPT	
SIGNATURE:		SIGNATURE:				SIGNATURE:					
PRINTED NAME:	TIME	PRINTED NAME:	TIME			PRINTED NAME:	TIME				

MEDIA: S - Soil W - Water A - Air DISTRIBUTION: White Copy - To Customer w/Report Pink Copy - To Job File Yellow Copy - To Lab